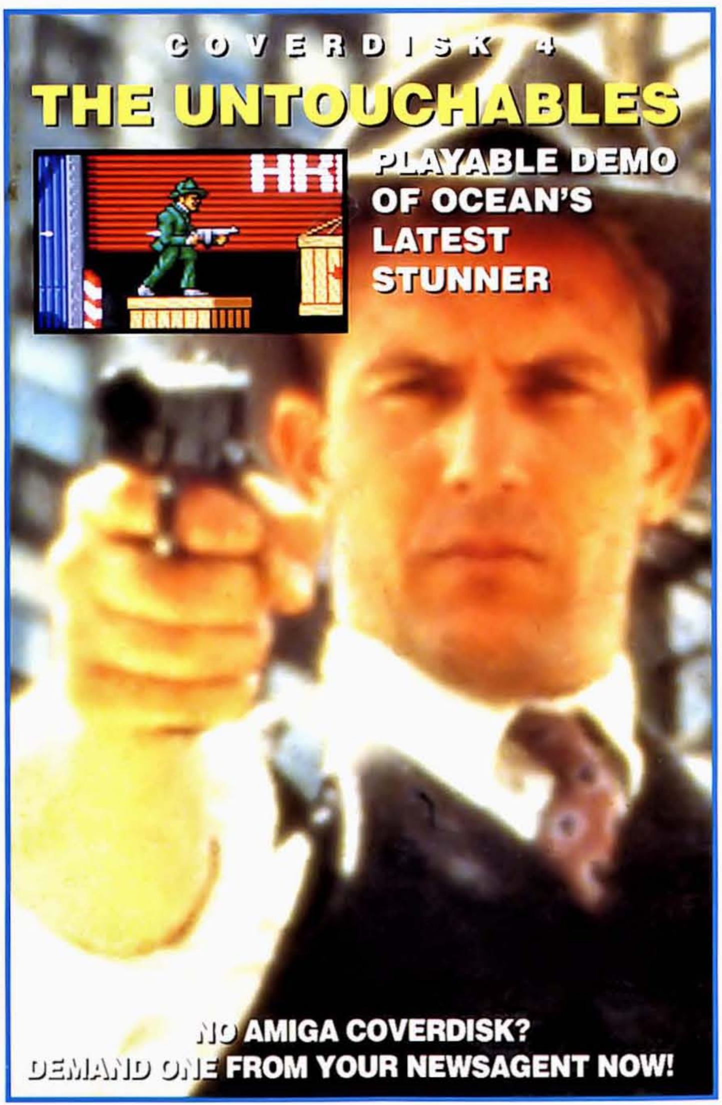
BRITAIN'S LEADING MAGAZINE FOR AMIGA OWNERS

AMIGA FORMAT

ISSUE 4 / NOVEMBER 1989 / £2.95

EVERYTHING YOU ALWAYS WANTED TO KNOW ABOUT YOUR AMIGA

[WELL, ALMOST...]





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WARGAMES 57

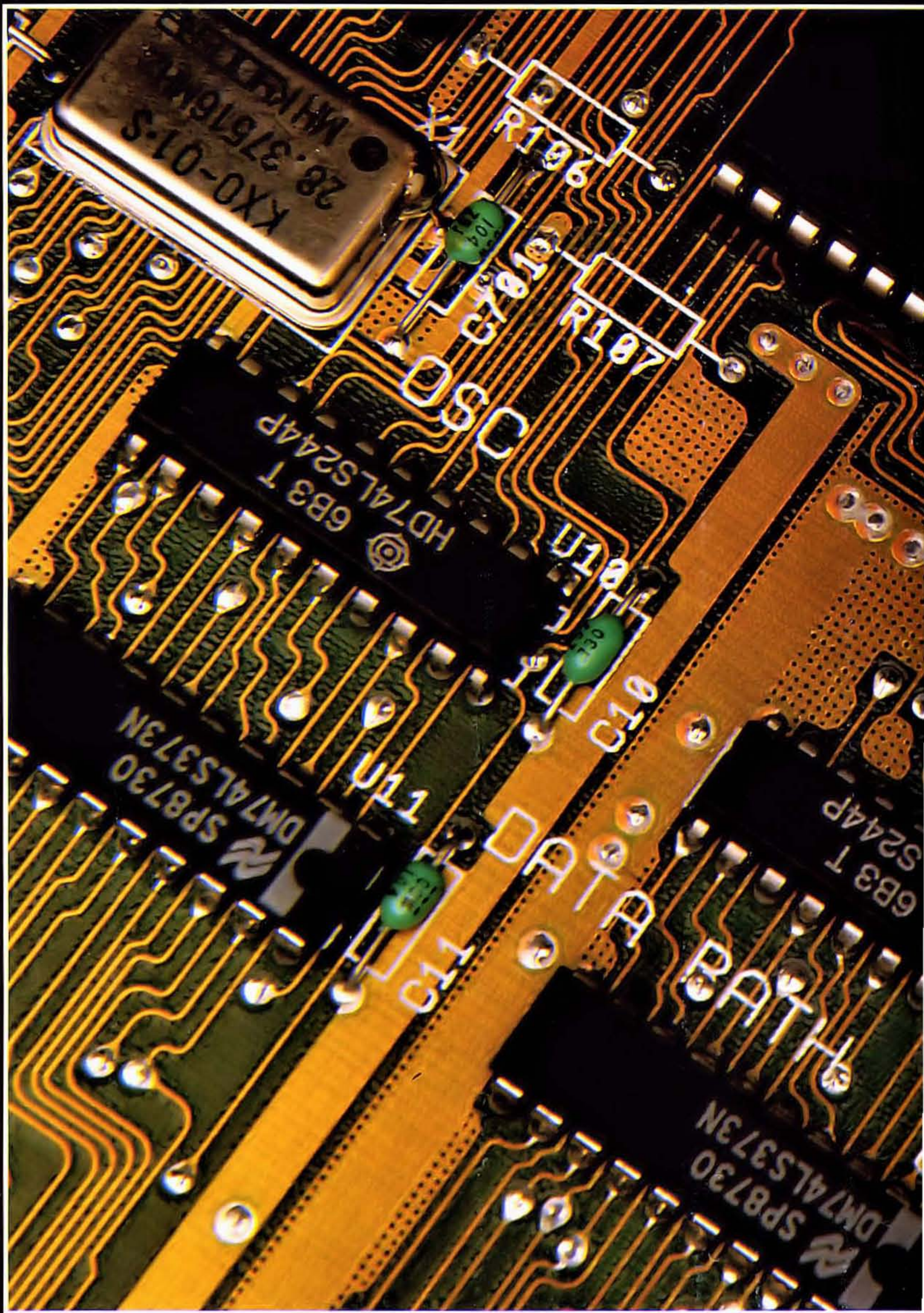


INNOVATION 12

REGULARS



■ In Previews: *Batman* on the streets of Gotham.



AMIGA FORMAT ISSUE 4 NOVEMBER 1989

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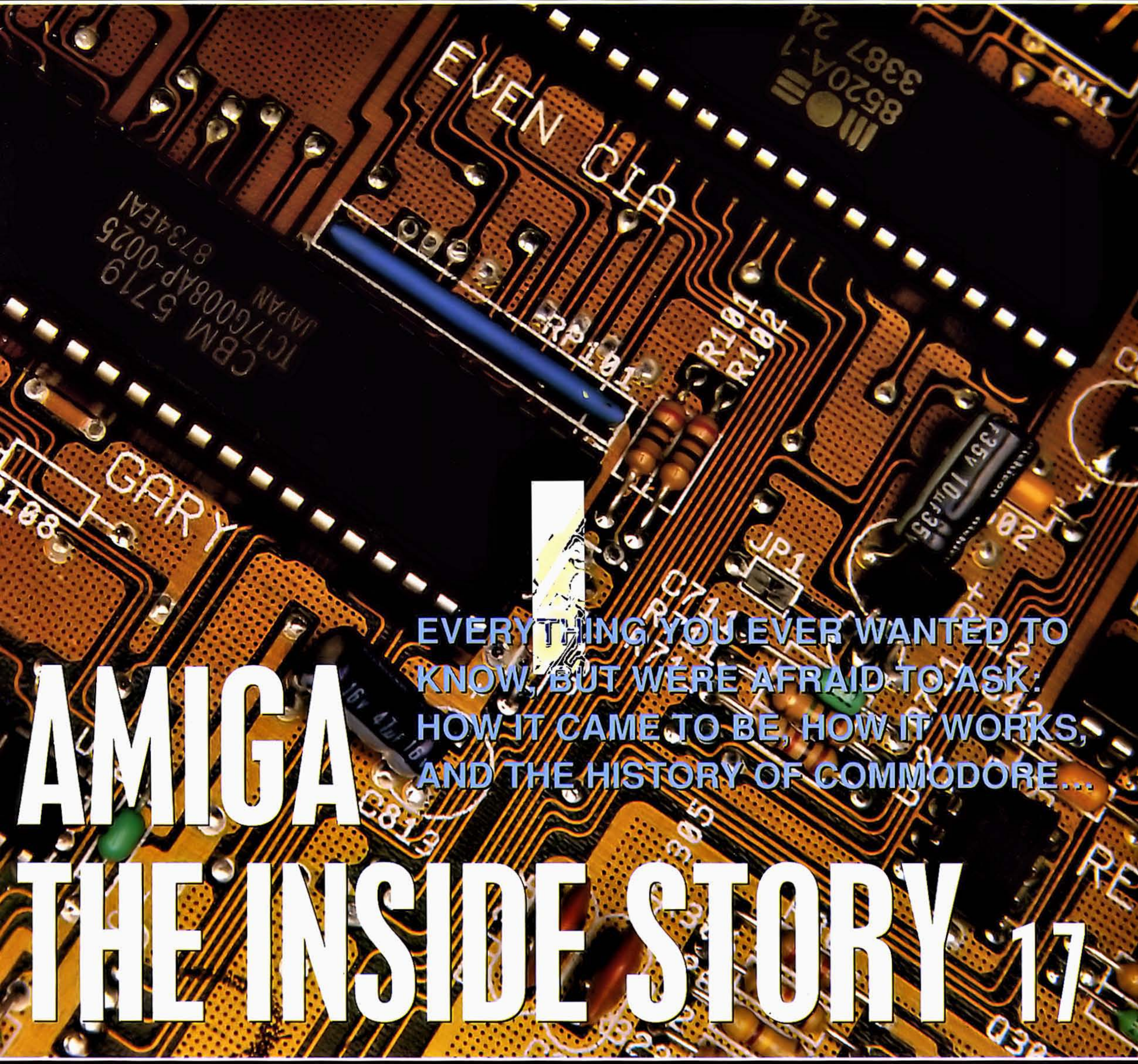
THE UNTOUCHABLES

Absorbing playable demo of Ocean's latest, concerning the exploits of Elliot Ness cleaning up Thirties Chicago.

SURF: explore the fascinating world of 3D solid modelling with this powerful, but easy-to-use program • **DEMO CORNER:** remarkable ray-traced animation • **ART:** marvellous picture gallery courtesy of Alastair Hearsum • **WORKBENCH HACKS:** the continuing saga of those fun little hacks • **GFXMEM:** displays memory availability with ease.

75





EVERYTHING YOU EVER WANTED TO KNOW, BUT WERE AFRAID TO ASK: HOW IT CAME TO BE, HOW IT WORKS, AND THE HISTORY OF COMMODORE...

AMIGA THE INSIDE STORY

17

GAMES

FORMAT GOLD

REVIEWED



■ Dare you walk abroad in the *Shadow of the Beast*?

COMPETITION



■ How to create a PR shot. 1 – get the photographer on the floor, 2 – wear smart suits, 3 – look mean and businesslike. Succeeding admirably are (left to right) Frank Herman, Andrew Wright and Alan Sharam of Virgin Mastertronic, hoping to make a big hit with their new budget software.

COMMODORE

Commodore have come up with a stunning bundling deal for the A500, which should see it storm into the Christmas shopping boom on a new high. Ocean's new game, *Batman the Movie,* will be launched simultaneously as both a separate release and as part of the A500 bundle.

It's the first time that a major game, which is bound to chart extremely well, has been bundled and launched at the same time.

That's not all that the 'Batman Pack' contains, either. There are three other pieces of software to add to the value of the pack and every one is a winner. As well as *Batman,* Ocean have put in *The New Zealand Story,* an extremely addictive and hugely enjoyable coin-op conversion that received a Format Gold award in Issue One as well as featuring in a playable demo form on that month's Coverdisk.

Electronic Arts are also contributing a great deal to the bundle, with *Deluxe Paint II* and *Interceptor.* Although it is not the most recent version of *Deluxe Paint, Version II* is an excellent art program that will show off to new A500 owners just what an Amiga can do.

The second EA program is Interceptor, a game that amazed both reviewers and public alike when it came out. It's a flight simulator that concentrates heavily on the graphics and gameplay to create a game that is superb in demo mode, and even better in play. Other games have caught up with it now, but it is still mightily impressive. This may all sound a little over the top, but this bundle has everything going for it – except maybe a

16 BLITZ-KRIEG

A startlingly-priced new budget label called 16 Blitz is selling games for just £4.99. The label is from budget specialists Virgin Mastertronic, the latter half of which was involved with pioneering the £2.00 price for budget 8-bit games.

The first Amiga game at the new price is *Infection,* reviewed on Page 53. It's an impressive debut title and it will be interesting to see how other software houses respond. Because the price is so low it seems likely that the 16-bit games scene will, like the 8-bit one, polarize into full-price and budget markets with no middle ground in the £10-15 area.

WHAT A SUPRA MODEM

A2000 owners interested in getting into comms will be interested in a new internal modem just over from the US. It's called the SupraModem 2400zi and is being sold over here by Frontier Software.

It fits into any bus slot, is Hayes compatible and, say Frontier, works with all popular Amiga comms software. (How about the unpopular stuff?) It has auto answer and dial, software that allows multiple modems linked to one computer and an adjustable-volume speaker. It also comes with a one-year guarantee and 90-day money-back offer.

It costs £169.95 and is available from Frontier on 0423 567140.



KEEP YOUR EYE ON THE BALL

It's amazing what you can do with an Amiga, a good idea and a silly company name. Alvin Christie has set up The Massive Eyeball Production Company with the help of the London Docklands Development Corporation.

The company is a computer graphics bureau that can produce letterheads, logos both static and animated, adverts, flysheets and reports in DTP. The **MASSIVE EYEBALL PRODUCTION COMPANY** are at Unit 3/1, The Docklands Enterprise Centre, 11 Marshalsea Road, Southwark SE1. Tel: 01 407 5527.

CAPTURE BATMAN



■ **The Batman Pack from Commodore – No 1 at Christmas? (Inset) Commodore's Marketing Manager, Jeff Earl: "We wanted to achieve a new standard by adding extra quality to the Amiga 500 and also ensure that our actions would help grow the Amiga software market."**

music program. At £399.99 we are bound to see these fly off the shelves and the ranks of A500 owners swell dramatically.

It's also interesting to note that the good ol' C64 has a new bundle as well containing a light gun, 3D glasses, games, quiz, music and paint software – even a typing tutor and audio help tape. All for £149.99. It's nice to see there's life in the old thing yet.

X CERTIFICATE

X-Windows is a windowing environment that has been around on meaty machines from such as IBM, DEC and Hewlett-Packard. Now it's available on the Amiga and because it has become an 'industry standard' it means you can hook up to any other machine that will run X-Windows.

X11 has resolutions of 1008x1024 on a special monitor and 704x560 on the standard one. At this point anybody unfamiliar with X-Windows is advised to prepare for a jargon onslaught. X11 uses TCP/IP over Ethernet for connection to other machines and a shared memory message passing scheme for local connections.

X11 also runs 'clients' that run under AmigaDOS – such as uwm, xcalc and bitmap. It also supports xpr to 50 different printers. The native Amiga windowing system can co-exist with X11, so you can operate both at once.

The program needs a 5Mb hard disk or NFS partition, 1 Meg of RAM and a 640x400 display. It costs £395, from the Amiga Centre Scotland on 031 557 4242, where Martin Lowe had this to say about it: "The Amiga's multi-tasking, multi-windowing and multi- screened operating system provides an ideal environment for X-Windows. An Amiga-based X workstation has no competition in terms of price/performance."

COVERDISK SMASHES

As we go to press, details of the next two Coverdisk game demos are coming through: and they are almost guaranteed to be two of the most enormous smashes of the coming season.

Issue Five, coming out in November, will feature *Ghostbusters II* from Activision, game of the big Christmas movie: and Issue Six in December will proudly present *Chase HQ*, Ocean's conversion of the arcade sensation. Whatever you do, don't miss them!



IT'S THE REALTHINGS

A wonderful thing has happened – your Amiga is alive. No, don't panic, it's not a virus story, it's about an interesting new venture in lifeform creation called *RealThings*.

The creators of *RealThings* claim it is "the software series that brings the living to your computer screen" using *Deluxe Paint III* as its medium. Using *Deluxe Paint III* they have created program disks that allow you to manipulate creatures in their own world of foreground and background scenery.

Each 'issue' of *RealThings* contains graded ability levels and material for different RAM capacities. There are three ability levels, and the disks come with example animbrushes, demos, environment source material (origami chicken?), drawings, 'tweening' (short for in-betweening, the intermediate frames in an animation) exercises and source pictures.

One of the issues, *On the Horse*, has pictures that compare the anatomy of the horse and man, showing where movement occurs – a help in tweening.

Other early issues of *RealThings* will cover animals, birds, insects, human activities and sports.

RealThings is produced by RGB Studios who can be contacted on 082 581 2666 and is distributed by Digipro on 0703 703030.

A ROLLING HARD DISK GATHERS CMOS

Good news for anyone with an A590 hard disk or thinking of buying one. Digipro are going to sell the CMOS RAM chips that can expand the memory up to 2MB. Each chip costs £16.95 – a grand total of £271.20 if you want the full 2MB. The chips are available from Digipro on 0703 703030

STAND BY YOUR FLAT BEDS

If you need a flat-bed scanner to scan anything up to A4 size, then HB Marketing have a new offering. It has a 200x200 dpi resolution, 2-16 levels of grey and takes 10 seconds to scan an A4 page. It uses thermal paper identical to that used by fax machines. It costs £499 and is available from HB Marketing on 0895 444433.



■ **Another novel joystick – the Quickshot Flight Controller.**

GAME TRAFFIC CONTROL

It's wacky joystick time again, as another weird variant hits the scene. This one is a two-handed number that has a cursor pad controlled by the left thumb and a fire button used by the right thumb.

It's called the Quickshot Flight Controller, although it looks more like a bike handlebar. It's priced at £12.50 and is from Spectravideo, who have also announced a price drop in their Quickshot Turbo stick to £10.50.

MAST SAIL ON

Memory & Storage Technology have released six new products for the Amiga – here's the lowdown, short but sweet.

AMIGA-A-TOSH – A slimline disk drive designed for use with the A-Max Mac emulator. Features Fujitsu mechanism, auto-eject, one year guarantee and special cable. Price £199.99, or £149.99 as a special promotion before November 15th.

BOING MOUSE – The optical mouse (as featured elsewhere on these pages) is also available from MAST at £79.99.

BRAKE – A small hardware unit that fits inside the Amiga and allows speed control over games software. Price £19.99.

AUTOFIRE – An autofire that lets you calibrate for different speeds of fire. Price £17.99.

CHANGE KICKSTART – This allows you to switch between versions 1.2 and 1.3 of Kickstart at the flick of a switch, solving software compatibility problems. Supplied without the ROMs at £29.99.

TWINIT – If you have an external disk drive without a pass-through interface, then Twinit lets you add a third drive. Price £11.99.

DIGITAL MAGIC

Driving fans will be pleased with DMS's next release, *Drivin' Force*, in which the player will have the choice of driving trucks, Formula One racing cars, bikes, cars and buggies, with jet-ski races thrown in for good measure. DMS are planning to follow *Drivin' Force* with an arcade-style helicopter shoot-em-up in the early part of next year.



■ **The Digital Magic crew: Paula Gradwell, Jon Law and, err, Jon Law.**

BOUNCING BABY MOUSE

The Boing mouse is a new alternative to the Commodore mouse, that promises "premium quality, exceptional design, ergonometric thought and the utmost ease of use." So what's so special about this mouse compared with the official one?

Most important is the lack of a roller ball underneath. The mouse operates by reflecting light back off a special mouse mat that is supplied with it. No rubber ball to pick up all sorts of dust and dirt. The buttons on top also require less pressure to operate and there are three of them instead of the usual two. All this may not sound like much but for someone who uses the mouse for long periods of time the improved ergonomics will be appreciated. The third button is also useful in conjunction with *X-Windows*. More details from the Amiga Centre Scotland on 031 557 4242.


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Yet the DreamTrack (TM) Corporation have created an insidious implant within the latest DreamTrack (TM) that is being mastered for release within the labyrinth of the Corporation's mainframe complex.
As a rogue dreamer, you have to enter the mainframe and direct your partner to the track itself – the minds of every future generation will be trusting to your skill and intellect.
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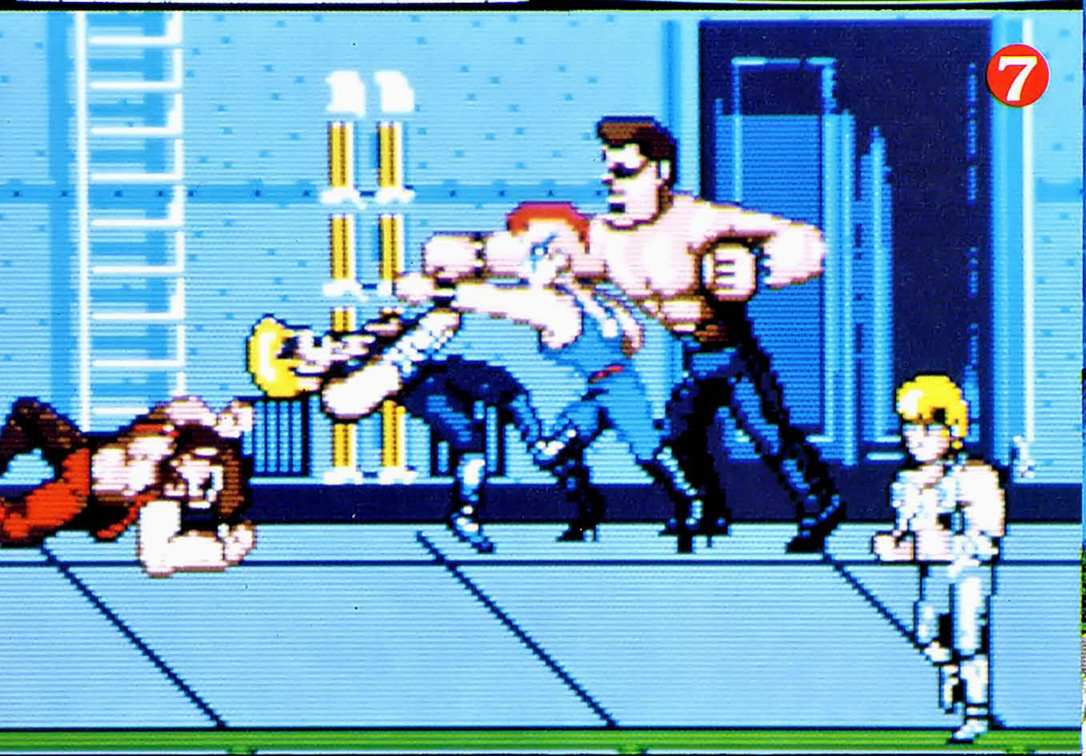
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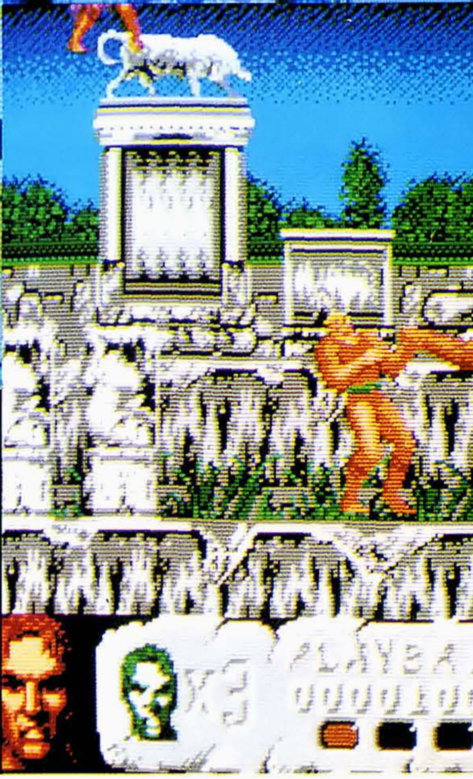


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10


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9



12

COMING ATTRACTIONS

THE GOODIES SOFTWARE HOUSES WILL BE TEMPTING YOU WITH TOMORROW.

1 OCEAN

Flying fans will soon be able to get their hands on *F-29 Retaliator*, a combat flight sim based on a fictional aircraft, but accurately modelled on current technology (with a little less accurate future technology throw in for good measure). This solid 3D game also gives the player four theatres of operation and other aircraft to fly. Keep your eyes skywards.

2 If flying a jet aircraft is all a bit too stressful and you'd rather just run about with a machine gun blasting away at baddies, then there's *Operation Thunderbolt* to look out for. This follow-up to the highly successful *Op Wolf* (both the coin-op and the great conversion) is guaranteed to keep your trigger finger blistered.

3 Mindless blasting too unethical for you? Fancy chasing after some criminals in a fast car instead? Then watch the roads for *Chase HQ*, (not pictured), a car driving game converted from the Taito coin-op. If you don't fancy that either, there's always *Batman*.

4 SYSTEM 3

After the not-so-hot *Dominator* comes *Tusker*, an arcade adventure with a few strategic elements thrown in, set in the heart of Africa. There are deserts, swamps, jungles (both past and present) plus native villages and ethnic temples to wander and fight your way through in a struggle to complete a mission your father started and perished trying to solve: finding the legendary elephant's graveyard. (No, it's not Greg Ingham's wallet!)

5 US GOLD

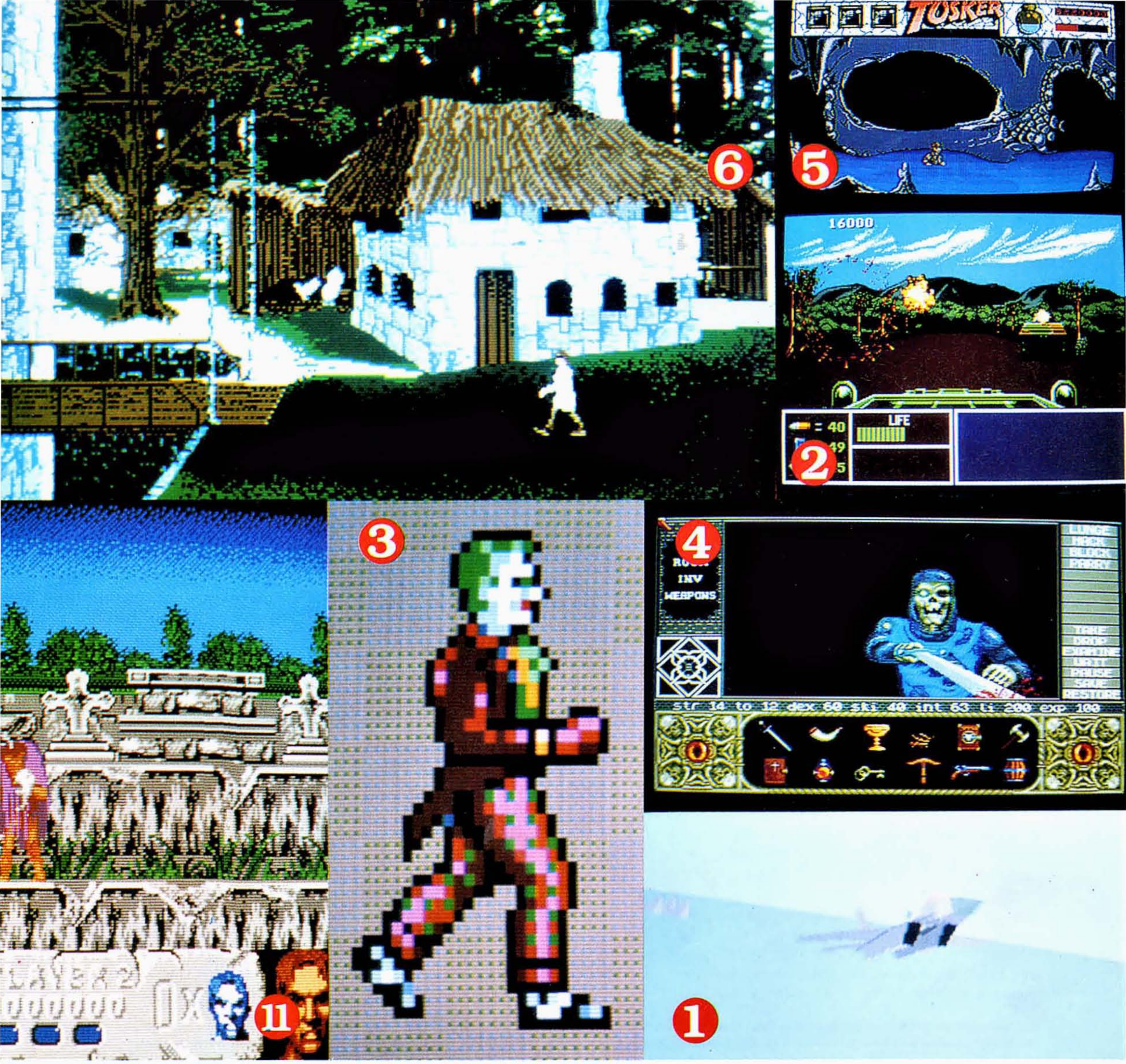
Role-playing fans are in for a double treat as first *Pool of Radiance* makes its appearance, and then the third official AD&D game, *Dragons of Flame*, arrives.

In *Dragons of Flame* (not pictured) you have to lead a party of brave souls (like yourself) against the two massive Draconian armies that are sweeping down from the north and are preparing to attack the city of Qualinesti. The countryside is full of wandering peeps, both friendly and unfriendly, and there are more than just a couple of foul creatures (chickens?) who've decided to take advantage of the chaos in their own sweet ways. How you react to them and deal with situations is up to you.

Pool of Radiance has you heading a party of up to six adventurers out to seek fame and fortune wherever you can in and around the city of New Phlan. For the fighters amongst you, you'll find the city's slums crawling with good things to go bash.

6 VIRGIN MASTERTRONIC

Beat-em-up fans will soon be able to get to grips with *Double Dragon II*, in which Billy and Jimmy are seeking revenge for the death of Marian. Who knows, they might even be able to bring her back to



life if only they can manage to battle their way through to the secret lair of the Shadow Boss with any success...

7 DELPHINE / PALACE

If you've always fancied playing an adventure game, but all that text puts you off, then Delphine reckon they've got the answer in the form of *Time Travellers*, an adventure within an animated game. Basically, the Earth of the 43rd Century is about to be destroyed because aliens have travelled back in time and planted some delayed-action time bombs, thereby avoiding Earth's hi-tech defences. Unfortunately, you've stumbled through a time gate and it's up to you to save us all.

8 HORRORSOFT

Following Personal Nightmare is *Elvira, Mistress of the Dark*. It's a completely icon-driven role-playing horror game that has you in the guise of a con-man passing yourself off as a freelance ghostbuster. You've been hired by Elvira to bust the ghost of her long-dead relative who's about to pop back into the real world after a few centuries. Perhaps you've bitten off more than you can chew this time?

9 CDS

Jumping on the football management bandwagon are CDS with *European Superleague*. You'll deal with such delights as: balancing training schedules, keeping up squad morale and confidence, dealing with boardroom politics and the press, and then contending with seven computer-controlled managers, all of whom play an experienced and tactical game. There's a multi-level gameplay structure and over 200 players, all presented with top-class graphics.

10 ARTRONIC

A sun-drenched island has been taken over by terrorists and only you, *Soldier 2000*, can save the day by destroying the enemy and rescuing the prisoners. You're armed with a variety of weapons and intelligence-gathering equipment to help you survive five missions with a time limit for each. So polish up your chopper and prepare to fly into the danger zone.

11 AMOS

Under the usual category of 'Coming soon and promising to be pretty damn stonking but just a little delayed' is *AMOS*, the long-awaited games creation package from Mandarin. Basically a mixture of a bunch of powerful utilities and a Basic-like programming language, *AMOS* is expected to offer the most powerful range of facilities for games creation this side of assembly language.

The time taken in writing *AMOS* has been spent ensuring that it can take full advantage of the Amiga's hardware, so look out for simultaneous display of up to 48 blitter-based software sprites, each with movement paths defined by a simple dragging of the mouse-pointer across the screen. *AMOS* can use up to eight different screens, each with its own separate resolution, bitmap, position and colour palette. Full use of EHB, HAM and overscan will be possible, with some very simple and straightforward scrolling. And to cap it all, *AMOS* will allow continuous music, a music editor, a sprite editor and a copper list editor. All this and more. We can't wait for it to reach us.

12 ACTIVISION

Altered Beast is due very soon now. The game's a conversion of the Sega coin-op and tells the story of a brave Roman centurion raised from the dead to do battle once more for the mighty Zeus. As the lead sprite you must rescue the beautiful Athena from the clutches of Nelf, evil lord of the underworld. He's a pretty tough customer, so Zeus has given you the power to change into fearsome animals by collecting mystical spirit balls from your slain opponents. There are five levels and loads of sprites, so things ain't gonna be easy!

IMMACULATE CONTRAPTION

DAMIEN NOONAN meets Sandy White, who decided it would be a pretty neat idea to print an Amiga screen on a full-size billboard…

Since James Watt first boiled a kettle, Scotland has been the home of many a great engineer: and Britain is renowned for lovable eccentrics. It would be unfair to include Sandy White, erstwhile games programmer and all-round pleasant chap, in the latter category: but if you despair the decline of individual ingenuity and initiative in these corporate days, read on!

Sandy decided it would be a pretty good idea to take an Amiga screen and print it, in full colour, big enough to be displayed on a billboard. So naturally he set about doing it. Simple enough, you might imagine. But have you ever tried building your own colour printer? Worse, Sandy had to invent one that could produce a reasonable quality image at a very large size.

First step was to print anything at all. Sandy decided the best way to translate the image on the screen into ink on paper would be to pull the image line by line off the monitor and print it line by line onto the paper. The first attempts were black and white, so only one colour of ink would be needed. The difficult bit was how to make the density of black ink on the paper the same as the darkness of the black on screen.

This is the clever bit: but, I'm afraid, it must remain a trade secret. The ink is slung onto the paper using an airbrush, but the control method is hidden within a shoebox on Sandy's overflowing workbench. A large metal drum scavenged from a scrapyard has the paper attached to it and rotates at a steady speed: at the start of the paper, a switch is tripped telling the Amiga to send over the first line of the picture. The gadgetry in the shoebox translates the lightness or darkness of each pixel on that line into amounts of ink which the airbrush sprays on. At the end of each line, as the drum comes full circle, a step-motor pulls the airbrush along for the next line.



■ Sandy White with one of his most remarkable successes, a T shirt printed in full colour. Registering the colour runs is no mean feat.

For Sandy, the step to full colour was a doddle. After some research into colour printing, he realised that the essential ingredients were three primary colours of ink: magenta, cyan and yellow. Moreover, it occurred to him that the colour monitor constructs an image from three primary colours of light: red, blue and green. So, a little elementary physics, a small home-written program to split the RGB display output, and a quick trip down the shops to buy the three colours of ink…

The colour print run works the same way as the mono, with one run for each colour. As any point on the paper builds up the right mix of inks, so it develops the appropriate colour. A professional printer will tell you that Sandy has got something badly wrong here, because the sort of printing that produces this magazine never actually mixes or overlays the three primary colours. But with the sizes and resolutions of Sandy's images, the elegant simplicity of his system has big advantages.

Firstly, the slight blurring from the airbrush minimizes separation between the pixels, so evident when blowing a screen up very large using, say, a photographic method. Although pixels are quite distinct, gaps between them are smoothed out on Sandy's prints.

Secondly, this method can be used to print equally well on any medium: printing on cloth, again because of slight blurring, is very successful, and Sandy has been able to print full-colour T shirts.

Sandy's venture is extremely ingenious and very deserving of reward or recognition. He is aware that it has certain commercial possibilities, particularly for printing large banners or exhibition displays, and has great advantages of cheapness and flexibility. If anyone out there is interested in talking to Sandy about his remarkable invention, please get in touch via the Amiga Centre Scotland, who will pass the message on. ■

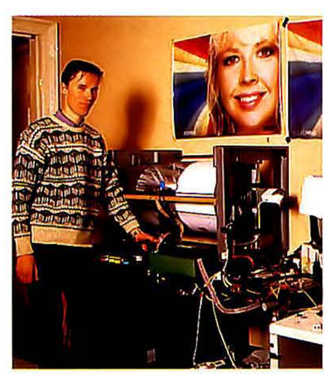
■ This massive print was produced in four bits, but the latest printer will handle this size in one sheet.



■ Sandy tinkers with the drum of the printer. Note the bicycle chain which pulls the airbrush along.



■ By Sandy's left hand you can see the controller-in-a-shoebox.

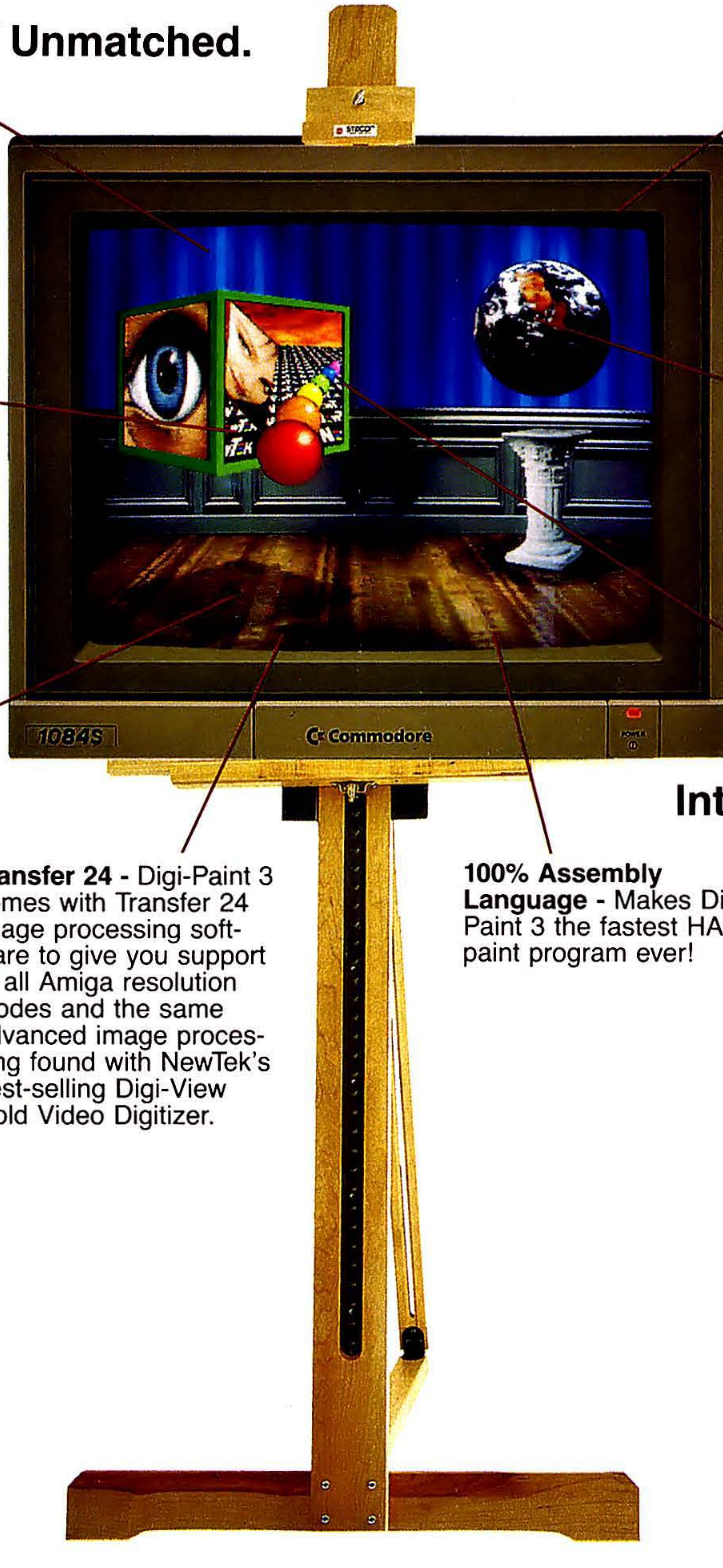


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WHO CREATED THE AMIGA? WHEN WAS THE A2000 LAUNCHED? WHY IS THE AMIGA SO GOOD? WHAT IS PAULA? HOW DOES THE BLITTER WORK? WHERE IS AGNUS? WHICH COMPUTERS HAVE COMMODORE MADE?



All this and much more in the next **SIX** pages...

YOU'RE HISTORY!

PHIL SOUTH tells the True Story of the Amiga

Once apon a time in America, and it could only happen there, a firm called Hi-Toro began work on what promised to be the best games console in the world, to beat Atari's ailing VCS machine. The VCS, as you may recall, was a brilliant little games machine which took little ROM-based cartridges and played cut-down, blocky versions of all Atari's arcade games. It was great fun and, although very popular, it was sunk by two big problems: the boom in home computers and the ET game. Home computers stole the VCS's market and so Atari were forced into a corner. What they really needed was a big, original game based on a film tie-in. They picked ET, which had just been a big hit for Steven Spielberg. It seemed like the ideal solution. A killer game, with the publicity of an all-time money making film would surely help them to hit back against computers. They threw a lot of money into the ET license and work began on the program. The money ran out and they hurried coding of the game. It was a disaster for Atari, and so they had to look for finance. At a similar time Jack Tramiel, the founder of Commodore Business Machines, was squeezed out of Commodore, and being the self-effacing and philosophical man we know and love, he bought Atari especially to get even. The scene was set.

And so, at a secret location in another part of Silicon Valley, Hi-Toro were embarking on that long journey down the road towards the Amiga. A trio of men with $7 million to spare invested it starting a new company to make the best games machine ever. The games console market looked secure, so the men felt they stood a chance. Before they got too far down the road they changed their name to Amiga, (Spanish for girlfriend) because someone finally noticed Hi-Toro looked silly. And besides, alphabetically and marketing-wise it was as well to have a name beginning with A. The name of the company was sorted, but they still had problems coming up with a name for the actual machine. After going through the usual varieties of fruit, nuts, birds, flowers and elements, they settled on the name Lorraine. Okay, so they could change it later, but at least for now no-one would know what they were discussing over the phone or in bars. At the core of Amiga's team were Jay Miner and Dave Morse. Jay was a chip designer, and before Amiga he designed the chips in the VCS and Atari 800 computers, plus a variety of medical and scientific projects. Dave Morse started with Tonka Toys and joined Amiga to market Lorraine to an expectant American public.

To keep the real project secret they made a range joysticks, rather like Konix and their games machine in recent times, and used the revenue from them as a bit of support for the Lorraine. The joysticks Amiga made were all weird and Californian: like the Joyboard, for example. This was a board with contacts at each corner which the player stood on, for playing surfing and skateboarding games, etc. The Joyboard wasn't a success, but it lives on today in the Guru Meditation messages. The story



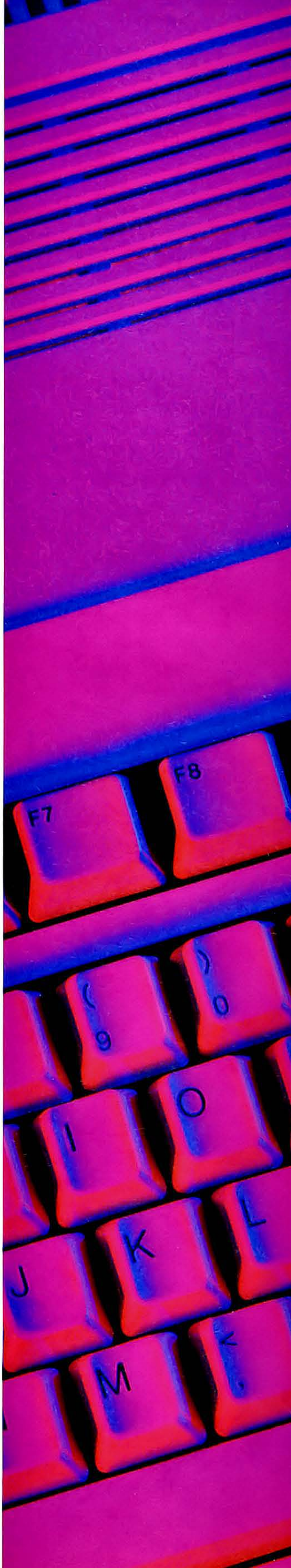
goes that one of the popular games at Amiga was to sit cross-legged on the Joyboard and run a special feedback program which tested how mellow you were by how still you sat. Meditating on the Joyboard was a popular way to relax after the prototype Amiga crashed, and so the errors were named accordingly.

After Jay and Dave came the charismatic RJ Mical, the software engineer. RJ had been with *Defender* creators Williams, working on games like *SiniStar* and *Star Bike*. Unfortunately the games were produced just as the arcade game business hit the slump created by home consoles and computers. So RJ was headhunted by Amiga to design Intuition, part of the programming environment of the Amiga: indeed the bit that handled the Workbench. You see, about this time it was becoming apparent that the console was out the window and the do-it-all computer to beat the Apple Macintosh and PC was the way to go. Unbeknown to the Amiga management a lot of 'options' had been added in development, like a drive, printer ports and a keyboard. The prototype, called Zorro, running on the Sage 68000 machines, was no games console. The circuit boards, which were later to be compressed onto the three custom chips Portia, Agnus and Daphne, became more and more complex as the project wore on. It had somehow mutated into a viable computer.

Riches To Rags And Back

Amiga had problems from the start. In order to interest companies in a machine you had to have one to show them one. And you couldn't afford to build one until you got someone interested. Dave Morse remortgaged his house to get the firm through some sticky spots. They took out stands at computer shows to secretly show the machine to software houses, and had all the hardware blow up days before. But against the odds, the machine wowed enough people at the Chicago CES Show in June 1984 to keep the project going. But they had to find a serious sponsor, who would either help them or (and this was the way it turned out) buy the machine out. Everyone was approached, including Sony, Hewlett Packard, Philips, even Apple Computers! No one was interested. Finally Atari showed an interest.

But don't forget, Jack Tramiel had a score to settle with Commodore and so tried to use Amiga as his secret weapon. He paid their debts and let them negotiate the price of shares in Amiga. The pressure was on: but at the last minute, when Tramiel was about the buy them out and use them as a stick to beat Commodore with, Commodore themselves called Dave Morse and bought them first. Rather than eating Amiga whole, as Atari wanted to, CBM set aside a new company inside itself, Commodore-Amiga, to house the machine. It was around then that the machine took on the name of its creators. Commodore put millions into it's development and the machine grew into a slim console with a detatched keyboard, on top of which sat the stereo monitor. It began to look like a seriously viable machine of the Nineties. ■



ONLY THE AMIGA MAKES IT POSSIBLE

The launch of the Amiga A1000 came in June of 1985, with Andy Warhol commisioned to demonstrate the graphics, and Debbie Harry singing along to the music chip, and sitting for Warhol. Warhol continued to use the machine until his death in 1987, and likened it to his previous work with screen print and paper. He'd digitise a face and colourise it with *DPaint*, splashing colour aound and editing the pictures, almost indefinitely for multiple versions of the same pictures. "The thing I like most about doing this kind of art on the Amiga is that it looks like my work" he said.

But the Amiga was expensive, over £1000, and no software existed for it, although companies like Activision, Electronic Arts and Microlllusions got behind it right away. The A1000 caused a stir, but that disturbance faded to a ripple in quite a short time, and all the Amiga activity con-

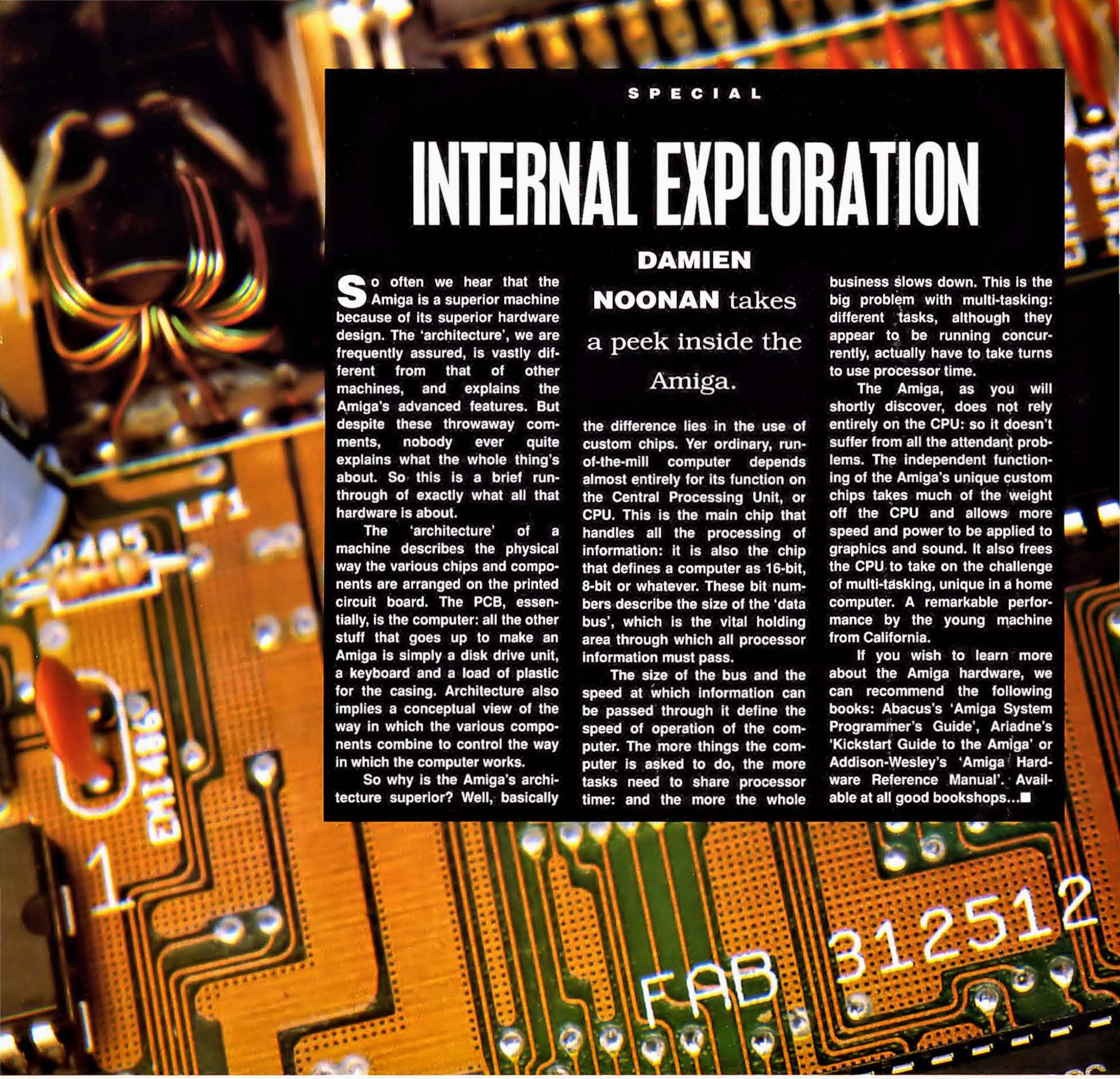


■ **Debbie Harry, a co-star in the Amiga's debut.**

tinued under the surface. And so it was, after spawning a kind of 'counter culture' of its own, with disparate enthusiasts all over the world conversing mostly though bulletin boards, the A1000 died to be replaced by the new game-player sized A500 and techno-PC sized A2000. These proved to be the most popular versions of the machine, and current figures state the Amiga now has 1,000,000 units sold worldwide: more than the Apple Macintosh, in fact. The only fly in the ointment, in Europe at least, was the Atari ST, which stole so much thunder from the Amiga originally by being the first 16-bit games machine on the market. But now that too is being outsold, and Amiga format games take priority with most UK software houses. The racks of Amiga games in shops are the same size if not BIGGER than the others. More programmers are using them to develop software. In real terms the Amiga has arrived!

By way of a postscript, it's interesting to note that Dave Morse and RJ went on to Epyx, where they've created the new 4096-colour hand-held games console, which coincidentally is being marketed in the UK by Atari. So, the spirit of Lorraine lives on, albeit in an Atari shell.

SPECIAL



INTERNAL EXPLORATION

DAMIEN NOONAN takes a peek inside the Amiga.

So often we hear that the Amiga is a superior machine because of its superior hardware design. The 'architecture', we are frequently assured, is vastly different from that of other machines, and explains the Amiga's advanced features. But despite these throwaway comments, nobody ever quite explains what the whole thing's about. So this is a brief run-through of exactly what all that hardware is about.

The 'architecture' of a machine describes the physical way the various chips and components are arranged on the printed circuit board. The PCB, essentially, is the computer: all the other stuff that goes up to make an Amiga is simply a disk drive unit, a keyboard and a load of plastic for the casing. Architecture also implies a conceptual view of the way in which the various components combine to control the way in which the computer works.

So why is the Amiga's architecture superior? Well, basically the difference lies in the use of custom chips. Yer ordinary, run-of-the-mill computer depends almost entirely for its function on the Central Processing Unit, or CPU. This is the main chip that handles all the processing of information: it is also the chip that defines a computer as 16-bit, 8-bit or whatever. These bit numbers describe the size of the 'data bus', which is the vital holding area through which all processor information must pass.

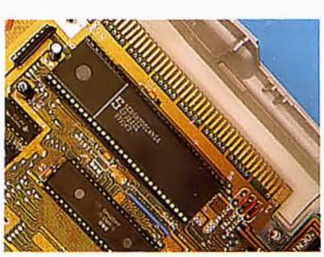
The size of the bus and the speed at which information can be passed through it define the speed of operation of the computer. The more things the computer is asked to do, the more tasks need to share processor time: and the more the whole business slows down. This is the big problem with multi-tasking: different tasks, although they appear to be running concurrently, actually have to take turns to use processor time.

The Amiga, as you will shortly discover, does not rely entirely on the CPU: so it doesn't suffer from all the attendant problems. The independent functioning of the Amiga's unique custom chips takes much of the weight off the CPU and allows more speed and power to be applied to graphics and sound. It also frees the CPU to take on the challenge of multi-tasking, unique in a home computer. A remarkable performance by the young machine from California.

If you wish to learn more about the Amiga hardware, we can recommend the following books: Abacus's 'Amiga System Programmer's Guide', Ariadne's 'Kickstart Guide to the Amiga' or Addison-Wesley's 'Amiga Hardware Reference Manual'. Available at all good bookshops...■

CPU: MOTOROLA 68000

The Amiga uses exactly the same 16-bit chip as the Atari ST and the Apple Macintosh, the 7.16MHz 68000 chip, first released in 1979. This is one of the best 16-bit chips because it has a very good

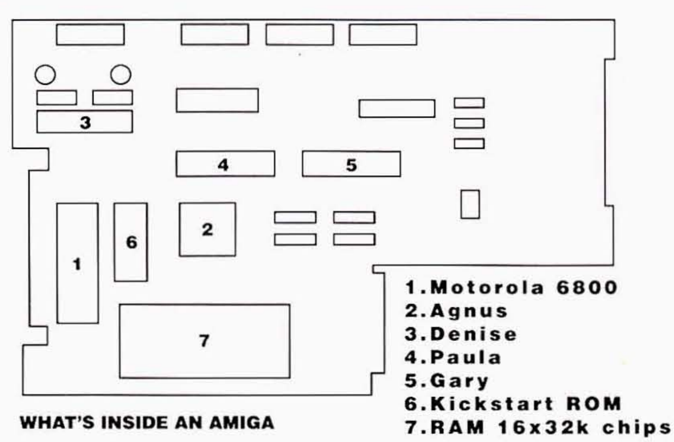


instruction set (the set of commands used to program it via a programming language.) The difference between the ST and the Amiga, however, is that the dear old Amiga does not depend on the 68000 to do all the work. Instead, it employs a set of custom chips known collectively as 'The Pad': Paula, Agnus and Denise. The custom chips are allowed to ignore the CPU completely, performing their own operations and accessing memory directly.

AGNUS

Agnus is the big boss chip of the Pad custom set. Although all three of these chips work together, each has its own independent tasks. A major key to this is the concept of direct memory access, DMA, which means that for their own allotted tasks these chips can go straight to the RAM chips to get information and so avoid using CPU time.

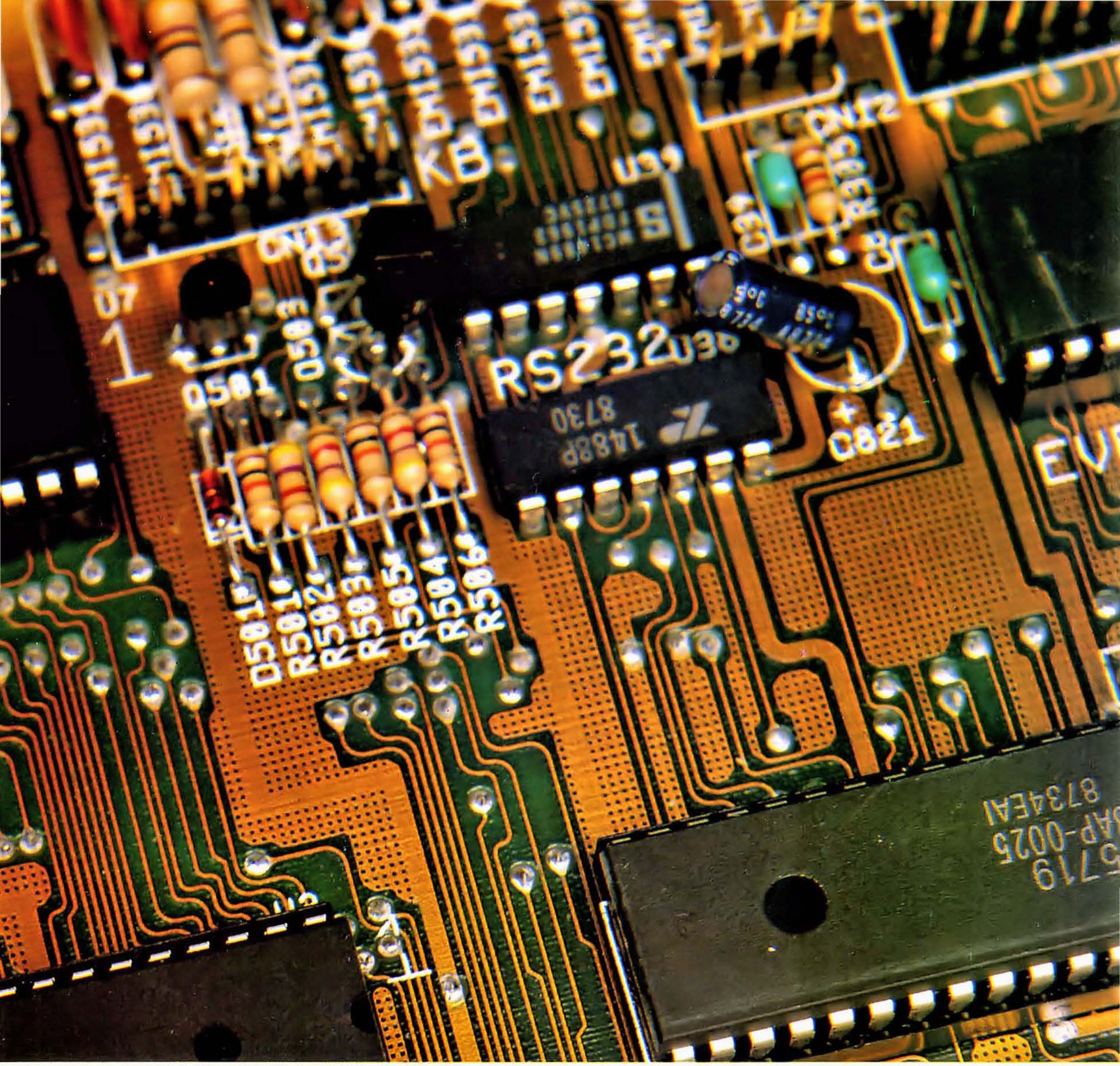
All three custom chips are constructed using VLSI technology. Standing for very large scale integration, this concept means that each chip (any chip is an 'integrated circuit') has many more

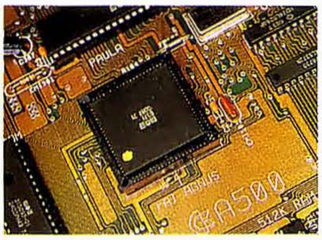


WHAT'S INSIDE AN AMIGA

separate pieces in its construction than is normal. So they are very carefully tailored to the tasks they are meant to perform.

Agnus is home to the infamous blitter. The blitter (standing for Block Image Transferrer, now being rephrased blimmer by Commodore, to mean Block Image Manipulator) is responsible for a whole wealth of graphics and display functions. It has three inputs (channels A, B and C) and one output (channel D), so it can do such clever things as take inputs of a graphic object, a mask and a





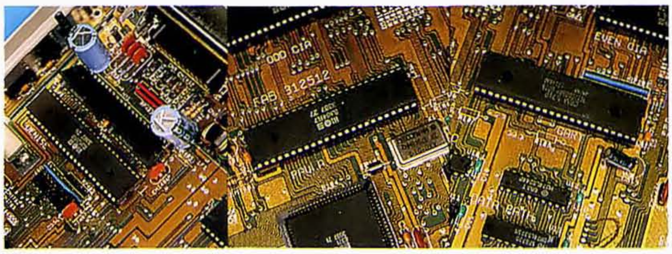
screen background and output the bitmap which represents the actual display on-screen resulting from these three elements.

The blitter can move a 16-bit chunk into memory every 280 nanoseconds, which is really pretty rapid. It has 256 logic instructions all of its own: and is also directly responsible for line-drawing and solid fills. It is quite capable of drawing nearly 4,000 lines every second.

Agnus and the blitter are also responsible for reading information from disk into memory. This is done a track at a time, starting from any point where the disk heads happen to be, sorting it all out into a sensible order afterwards. Again, this is a DMA function so uses up no processor time at all.

DENISE

Custom chip Denise's specific responsibilities are to control the major functions of screen display. It converts bitplane information into an actual screen display. It also includes the copper, a simple graphics co-processor with its own three commands, which basically monitors the functioning of the screen display (actually watching where the phosphor dot is which draws the screen). In this way it can handle such weird displays as split-screen, which is particularly handy for the pull-down screen capacity of multi-tasking. Denise also controls the mouse and handles sprites: the mouse pointer is a good example of a hardware sprite.



Denise **Paula** **Gary**

PAULA

In much the same way as Denise controls the physical realisation of screen display, Paula is in charge of the output of sound. It is a four-channel stereo sound-chip, building an audio output into analogue impulses that the speakers can handle. Internally, sound information is handled entirely digitally: it is built up from waveforms stored in memory. This digital wave-form technique is what gives the Amiga its massive sound sampling and manipulation abilities.

GARY

The function of the other named chip is not so dramatic, but no less important. Gary is a contraction of 'Gate Array': it monitors interfaces, handling the movement of data to peripherals such as a Bridgeboard.

ONCE UPON A TIME

PHIL SOUTH tells the story of Commodore.

The Amiga, although not truly a Commodore computer born and bred, is the most recent in a long and complex lineage stretching on back to beginning of time itself... well, the beginning of personal computers anyway. Commodore Business Machines were originally in the cash register and typewriter business, not unlike IBM, until by several twists of fate they invented the PC and the leisure computing business. Let's dig through a few layers of dust into the prehistory of the personal computer, and see where it all came from. Follow me into the vaults... (hehehe!)

Early Days

After 20 years of making electric typewriters and the first hand held calculator, in 1974 Commodore Business Machines bought a firm called Micro Office Systems. This move was to open up a new hi-tech range of products, since some of the founders of MOS were ex-Motorola chip designers.

In 1975 the ex-Motorola boys figured they could improve on their 6800 CPU design, and incorporate a lot of the other chips, like aritmetic units etc, into the main chip. The result was the famous 6502, the so-called "computer on a chip". This chip was to form the basis of all their most popular home and business computers.

As well as the 6502 they designed the Versatile Interface Adaptor, which enabled them to make their first real personal computer, the Keyboard Input Monitor, or KIM1. This was to be the father unit of the PET series. For ease of use the KIM1 had power supply, cathode ray tube and keyboard all inside the same case: and not only that, it was the first computer to have Basic language on ROM, so was ready to program on bootup.

The design was so enthusiastically recieved it prompted two young boys called Wozniak and Jobs to make their first home computer in a garage and call it the Apple. And fellow Business Machine giants, IBM, were also interested in producing their own personal computer, or IBM PC.

Soon after, at CES Chicago in 1977, Commodore launched the Personal Electronic Transactor, or PET, to an expectant world.



■ **The Commodore P500, an ill-fated variant on the PET that was only produced in limited numbers as a prototype and is now very rare.**

The PET Days

In 1976 I was in college learning 'Computing', which consisted of writing programs on paper, typing them onto a paper tape puncher, and then running them through a teletype linked by phone to a DEC System 10 in Hatfield. A labourious and tricky process, especially as you could never see if you'd typed your tape right until it came up on the listing from Hatfield. This was no way to develop programs, and so the idea of having my own computer germinated in my brain. But as I say, as yet the home computer didn't exist. I had to wait two years before one night on 'Tomorrow's World' I first saw a Commodore PET.

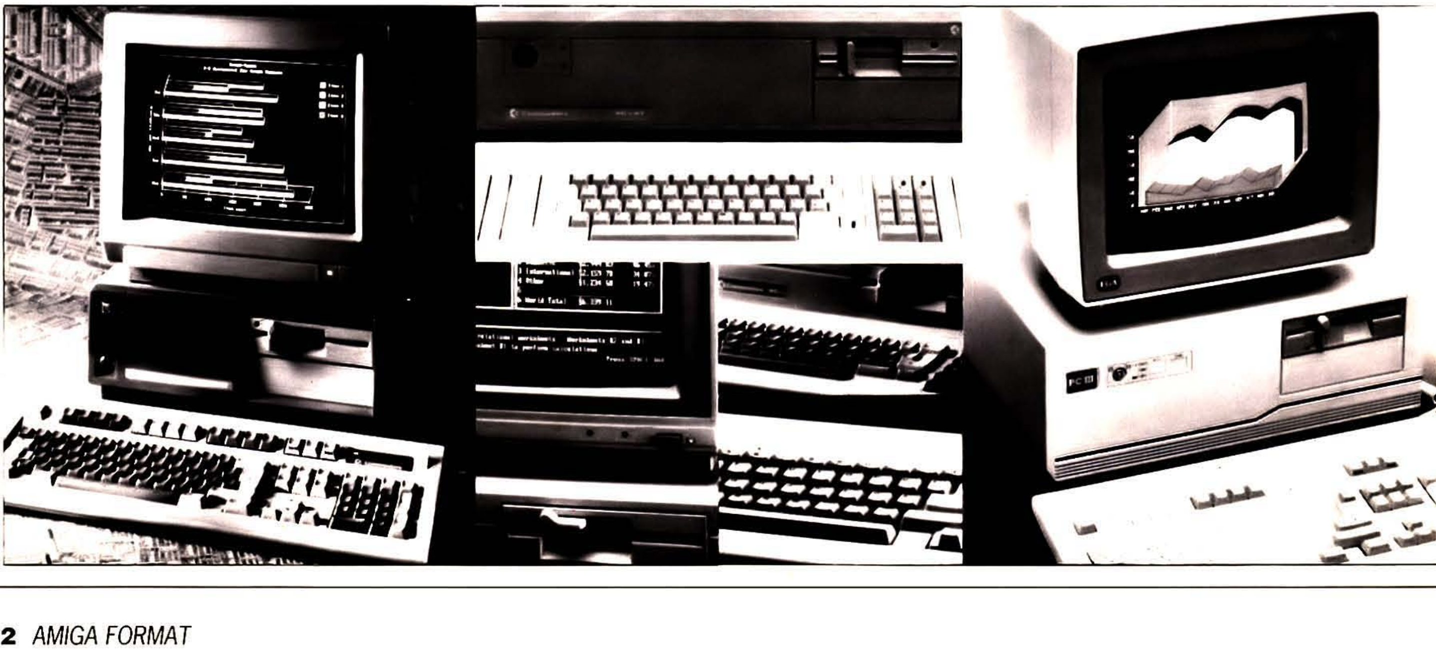
A young Judith Hann was pretending that the computer could hear what she said, and it was printing up things on the screen like, "Hello Judith, My name is Hal" and all that stuff. The computer was a one-piece affair, with a monitor built into what was, by late 70s early 80s standards, a very futuristic cabinet. All you needed to add was a special computer driven tape recorder to load and save programs from it. Other than that the whole unit was sealed and ready-to-go for use by beginners, because, let's face it, we were nothing but beginners then.

The original PET 4000 series was 4K and had a monochrome screen, but it looked like a Cray 1 to me. Then came the 8000 series with 8K. Then came the disk drive, a huge great clonky thing with a cabinet as big as a VHS player which had two drives in it. Now we could load things from disk and have random access, but at a price.

The Commodore 500, towards the end of the PET era, was no more than a curved Star Trek casing incorporating a disk drive or two, a detachable but flush fitting keyboard, and a few bells and whistles over the old PET

FROM PERSONAL COMPUTERS TO 'PC' CLONES

Commodore, inventors of the personal computer, returned to compete on IBM's terms with their PC range in 1985, and have been making ground ever since...



design. Although this design continued as a contemporary to the 64 even, in the form of the 128K 8296-D business computers, what was needed was a totally new design and a new market.

VIC 20

The VIC was the first colour computer from Commodore, and it was the first computer in the home to be made specifically for games use. Of course the real hackers made it do other things, but it had graphics, sound and joystick ports. Leisure computing had arrived. It was called the VIC after its video chip, and was based once again on



■ **The 8296-D, a PET variant that was intended for business use.**

the 6502 CPU chip. The VIC had the same casing as its later model the Commdodore 64, but in off-white. Loading was from tape, using a dedicated tape drive which took its power from the computer. This meant you could have multi-loading games which loaded each section automatically. The 5.25" 1541 floppy disk drive was made available, but few people except game developers could afford one. And you really did have to have multiload games, too, as the VIC only had 3.5K memory, of which only about 2K was usable! You could get 16K memory packs for it in later years, but by then a new souped-up version of the VIC was designed, the Commodore 64. ■



64 AND ONWARDS

This was to prove the company's biggest success since the PET. Bigger even. In fact, until the Amiga the 64 was the Commodore computer with the highest sales. Although the 64 also contained the new VIC chip, the VIC-II, and the 6502, it also had another chip specially designed for sound production, the SID chip. This was a three-channel synthesiser and is to this day the best sound chip in a computer until the Amiga.

Initial versions of the 64 were off-white cases with brown function keys just like the VIC, but soon the machine was recased in grey and rebadged. The computer used the same tape drive and 5.25" disk drive as the VIC, but they were rereleased in the 64's new grey-coloured plastic. The 64 soon found its niche in the computer world, allowing killer games to be designed for its enormous 64K memory and 16-colour graphics, but also serious business programs like Visicalc and Visawrite. The 64 was destined to linger even after its 'death', as the 128 had a 64 mode, and the Amiga had a 64 emulator written for it. It is to this day one of the best selling computers of all time, and still sells well in its new 64C incarnation, with 80s-style 3.5" disk drives, and new ivory casing mimicking the C128 and Amiga's slimline good looks.

Commodore SX 64

This was the portable C64, although 'luggable' was the appropriate epithet. It's the old story that if you put a handle on something, it's suddenly portable. Even if it weighs 14cwt. The SX64 was a 64 in a smart grey and blue box, with a handle which doubled as a prop to angle the front up, and a detachable keyboard which doubled as a lid. Inside was also a single 1541 disk drive, and a rather nice little 3.5" colour monitor. The whole package cost about £700-800 as I remember, and everyone wanted one. It was the gizmo for the hacker who had everything.

Commodore 16 and Plus 4

An abortive attempt to open up the games market was the C16 and Plus 4 debacle. The C16 was 16K version of the 64 with a slightly different operating system and a black case. It shared this new OS with machines, but just because Commodore botched the marketing of them. That and the fact that people wanted more memory in their computers, not less, and both the C16 and Plus 4 featured highly non-standard cassette, joystick and video ports.



■ **The C64 CPU and keyboard unit in its original form, owing something to those P500 days.**



■ **The C64 re-cased to retain its impetus in the more fashion-conscious days of the late Eighties.**

a futuristic business machine called the Plus 4. The reason it was called the Plus 4 was that it included four hard wired programs built into its systems, so you had a wordprocessor, spreadsheet, database and business graphics all ready to go every time you booted up. The machines bombed miserably. Not because they were essentially bad

Commodore 128 and 128D

Finally cottoning onto this trend of more K for your money being a 'good thing', and in order to keep up with the 64 owners who already had a few years' software under their belt, CBM launched the C128 in 1985. The C128 had a futuristic look, 128K, a new OS and Basic Version 7, a built-in C64 mode, plus a fully-fledged C/PM computer. By giving the people these three computers in a box, the folks at Commodore hoped to please all of the people, all of the time. They had the C64 compatability problem sussed, a business computer in the shape of the C/PM machine, and better graphics in the shape of the 128. The reception of the 128 was mixed, but interest grew and Commodore rubbed their hands together as they looked at a rosy future.

But they were, in spite of the partial success of the 128 and 128D, destined to falter and almost go under, due to well documented and much-mocked financial problems. After many aborted launches of possible successors, including an interesting LCD screen laptop along the lines of the Plus 4, (whatever happened to that?) Commodore retraced their steps in early 1986 with the 128D.

The 128D was a variation on the 128, with a built-in disk drive and separate keyboard. It looked not unlike the Amiga would look the next year. The 128D gave them a brief respite, selling well to the education and small business end of the market. By this time they were already into business computers, with the release of the 16-bit PC clones, the PC10 and PC20, in 1985. But it wasn't until the Amiga came along that they would reprise the kind of success they had with the PETs and C64s. Which neatly brings us up to the present, and towards the future...



■ **The C128D, by this stage in its development one of the most impressive computers of its kind: and (inset) the rather less successful Plus 4.**

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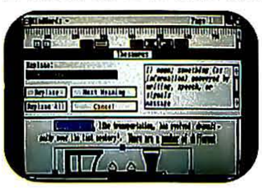
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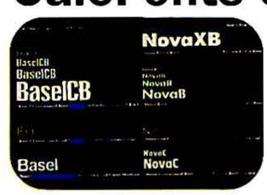
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HEAD T

BRIAN LARKMAN takes a look at what *Photon Paint 2* and *DigiPaint 3* can *really* do with an in-depth 'working' review full of tips and tutorials, criticisms and witticisms to help you choose which HAM package fits your needs.

Just a couple of years ago, most Amiga users thought that HAM was eaten with mustard. Even for those who knew what Amiga HAM was, HAM painting packages for the Amiga were revolutionary.

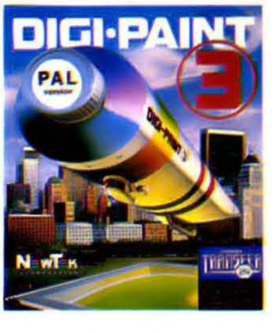
The undocumented and difficult-to-use display trick that Jay Miner, the designer of the Amiga, originally wanted to leave out, had been used by NewTek for the photo-realistic images from their DigiView digitiser. Then they had striven to develop a screen-painting system that could operate on these 4000-colour pictures, incorporating features like variable transparency that only an omnicolour system can convincingly support. For a while they held the stage.

A year later Microlllusions released *Photon Paint*. With an easy, *Deluxe Paint*-like interface and spectacular 'surface mapping' tricks, *Photon Paint* has become by far the most popular HAM package. Now, as a sign of the Amiga's growing maturity, both these HAM systems have been extensively updated and revised, *DigiPaint* with a new interface, super-bitmaps and a form of texture mapping, and *Photon Paint* with contour mapping and animation, plus lots of small improvements.

Briefly, Head to Head

In many ways both packages are quite similar to the original versions they replace. *Photon Paint 2* (*PP2*) has retained an almost identical interface, with the only major changes appearing on the menus. *DigiPaint 3* (*DigiP3*) uses a similar screen layout to the original, but it has a greatly improved appearance, using several control panels for Tools, Text, and Transparency and Texture Mapping. (*DigiPaint 2* apparently had most of the new features but the old-style interface: it was only briefly available in the US.) The drawing tools provided by *Photon Paint* were always excellent, almost up to *Deluxe Paint* standard. They have now been improved by the addition of an Airbrush and Polygon Brush Cutter.

Only the provision of Bezier-type curve drawing and anti-aliased lines (like those in *Spectrum 512* for the Atari ST) could improve things to any degree. *DigiPaint* on the other hand, is quite pathetically equipped, having not even a Flood Fill let alone Airbrush. Really quite a remarkable omission. To be fair though, the chance to use any tool to cut a brush, or to pick up the last shape drawn, even a transparent one, or



DIGIPAINT 3
£69.95 ■ All Amigas ■
NewTek/Precision
Tel: 01 330 7166



PHOTON PAINT 2
£89.95 ■ All Amigas ■
Microlllusions/DigiPro
Tel: 0703 703030

O HEAD

to grab the area under the last shape, almost makes up for the lack of any kind of fill!

Special colour and shading effects are really the main justification for using the difficult HAM mode of the Amiga. Both packages have a very similar set of colouring effects or Modes, but they use quite different methods to implement them.

PP2 provides both Foreground (left button) and Background (right button) Mode menus so that, with the aid of the elegant Blend control, a huge range of effects can be applied. *DigiP3* uses an improved Transparency (blend) control but this still doesn't come close to that of *PP2*. Both programs can also now produce gradations of colour between two defined limits. This is especially easy using *DigiP3*'s Range control. Overall, both programs can apply a wide range of special colouring and transparency effects.

In order to manipulate digitised images, pasting sections together into a collage for instance, it is essential to be able to transform the cut sections or 'brushes' in a wide range of ways. *Photon Paint*, like *Deluxe Paint*

FIRST IMPRESSIONS

The best test of a painting system once you are familiar with its tools and interface, is to sit down and quickly doodle with it, working as fast as possible and not really thinking about the subject matter, so that the ease of use and 'painterly' qualities of the program are shown up. These two images are the result of that test, though the figure was added later. Somewhat suprisingly, considering the lack of so many elementary tools, *DigiPaint* came out top for ease of use and access to the special effects, and it shows in the images. The *DigiP* version looks more effective and 'mysterious' although it took half the time to produce. For both pictures the 'Range' or 'Graduation' mode was selected most of the time. In *DigiPaint* transparency could be selected at the same time allowing a soft edge to the marks as well as a range of colour.

In *Photon Paint*, the use of Graduation mode precludes the use of transparency, giving a somewhat hard edged look to the clouds. A softer mark is possible but the richness of colour produced by graduation (or range) is lost.

One simple but effective trick used by *DigiPaint* but not by *Photon Paint* is the patterned dither. This is displayed to great effect in the sky of MountainMan. It looks just a little unnatural, adding to the strangeness of the picture, but also it seems to produce a more gentle graduation of tones from yellow to cyan, avoiding the 'square' banding that the *Photon Paint* graduated fill exhibits.





■ **MountainMan: in *DigiPaint 3* on the left, and *PhotonPaint 2*.**

(which it emulates in this respect), has a comprehensive set of tools allowing scaling, flips, free rotation, bending, stretching, twisting and tilting in 3D perspective, as well as all the mapping tools discussed in the tutorial. The only real problem is that most of them are slow and some are almost geological in their time-scale. The results are usually worth waiting for though.

DigiPaint on the other hand... well, let's just say all of the... erm... both of the tools are quite fast! Scaling and distortion CAN be achieved using the Texture Mapping feature but that means losing any brush stored in the clipboard, re-setting transparency and 'warp factor', and making Mr Spock laugh. A bit clumsy really.

Titling and other forms of fancy text manipulation are an important task that paint programs are often required to perform. Both these systems can use any of their special effects to produce spectacular custom fonts, but *DigiPaint* is much easier to use and experiment with. Text is typed into a custom requestor on the Text control panel and transformed into a brush for placing ➧

on the screen. Any attribute set in the transparency and warping control window or mode menu is applied to the brush and can be changed interactively, even while the text is pasted down on screen.

Photon Paint writes text direct to the screen, word processor style, so it must be cut as a brush for special effects to be applied.

Amigas of 1meg or more are capable of storing much more than one screen of display and both these programs use this facility, but in very different ways. *Photon Paint* is no longer limited to one spare screen: as many screens as memory will allow can now be stored at once. Various tools are provided to flip between them to produce a slide show or animation (a series of images can even be saved in Anim format). No real animation tools are provided: due from *Photon Paint 3* perhaps?

Instead of offering more screens, *DigiPaint* provides Super Bitmaps – screensizes up to 1024 by 1024 (limited by available chip RAM). Moving around this huge picture area is simplified by an excellent form of Autoscrolling. As the pointer touches any screen boundary, the picture quickly and smoothly scrolls across to reveal more of the image. This effect is made even more useable because with it you have the ability to apply effects and expand drawing tools beyond the edge of the screen. A small brush of perhaps 20 x 30 pixels can be texture mapped to cover a 600 x 400 screen, and smoothing is even provided to break up the edges of the huge square pixels that result. A good software pathway to larger screens and higher resolutions!



■ **This remarkable photograph has been reworked using *Digipaint 2***

Conclusions

DigiPaint 3 is a rather curious and quirky piece of software. It has all the signs of being a very professional system but still doesn't quite make it. It has an excellent interface that encourages a fluid, painterly style and some very clever tricks. Repeat is brilliant and the effect of 'patterned' dithering is really attractive. The Texture Mapping and Warping system is quite versatile. Most operations are VERY fast (for a HAM system).

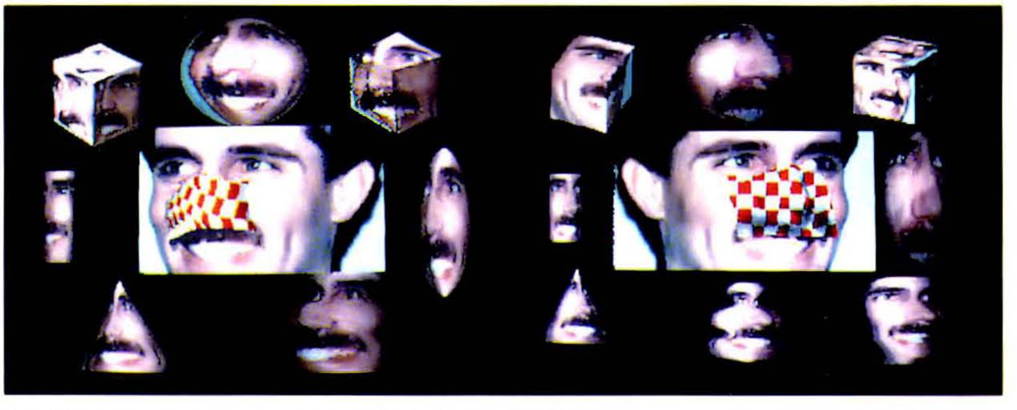
Nevertheless, the lack of elementary tools like fill and airbrush,

MAPPING TUTORIAL

Only by using HAM can the Amiga perform the more advanced graphic tricks of mapping. To give the impression that a flat picture is wrapped around a 3D object, the colour and distribution of the pixels making up the image is subtly changed so that those furthest from the viewpoint are smaller and darker than those nearest. Similarly those nearest the supposed lightsource are lighter in colour than those further away from it. This process is known as SURFACE MAPPING because the pixels are 'mapped' onto the imaginary smooth, curved surface of the object. Both the programs reviewed here refer to this, rather inaccurately, as Texture Mapping.

Usually a complex object, such as a face, will have shadows and highlights that correspond to the hollows and peaks. Working from the intensity values of these shadows it is possible to produce a 3D computer model with lines following the 'contours' of the original. Once the contour map has been constructed a flat picture can be mapped onto it: a process known as CONTOUR MAPPING.

In reality, most objects have some sort of texture – rarely are they perfectly smooth. The way that light is reflected and absorbed by different textures can also be predicted mathematically. Thus when a picture is mapped onto a surface, further subtle changes of tone can be applied to simulate these various textural effects. This technique is known as TEXTURE MAPPING. Surface Mapping is the most gimmicky trick offered by HAM paint programs and can produce the most spectacular effects almost immediately, but once you have wrapped your favourite picture onto a sphere what can you use it for? Not a lot.



■ **JimWraps: in *DigiPaint* on the left, *Photon Paint* on the right.**

For normal day to day work, Surface or Texture Mapping is invaluable as a means of creating 3D objects made from any textured material: marble or wood, brick-work or tiling, patterned fabric or fish scales. Both programs offer some form of mapping: *Photon Paint* onto geometric solids and freehand objects, lit by user-defined illumination; *DigiPaint* by filling solid shapes with a brush and warping them to a degree.

For more formal shapes the *Photon Paint* method seems to be more efficient, as JimWraps shows. All of the standard wraps are shown with the same brush used for each and Luminance set to about 4. Displayed against a black background, these wraps look quite effective.

Against other colours the result may not be as good. With luminance set, the edges of the wrapped object are usually quite dark to emphasise the 3D effect. Against light backgrounds this is not very realistic. Better results can be achieved by not using Luminance at all. The object is wrapped as usual but with Lum off. The brush will then be distorted but will have no lighting effects. To produce shading use Blend set to Graduation with mid to dark grey as a background colour and the highlight set to suit the shape of the object and light direction. Cleaner objects are produced with Blend set to zero.

Another problem with the darkening effect of luminance is that ragged edges can appear after wrapping. These are caused by the dark edge being the same colour as the background and therefore interpreted as transparent. This can be avoided by setting the background colour to an unused bright shade (bright blue for example) before cutting the initial brush or wrapping it.

The *DigiPaint* examples were all simulated using Texture Mapping, Warping and Transparency control. The results could have been improved with more experimenting and touching up, but then each would have taken much longer than the *Photon Paint* examples and distorted the comparison. The method used was to Map the 'face' brush into the chosen shape against a black background with edge transparency set to about three-quarters and warp set to about half. (Coloured effects can be produced by working on a coloured background on the spare screen.) Picking up the resulting image

ALL ABOUT HAM

The unique thing about a HAM display is that very few pixels have their own, uniquely defined colour. Rather, they derive their component RGB levels from the pixels adjacent to them. The advantage of this is that many different colours can be displayed, by a sort of 'domino' effect: the disadvantage is that updating a changed display can be quite slow. To understand how HAM works we need to get a bit technical.

To display a picture on screen the colour of each pixel must be stored as a list (the 'bitmap') in memory, starting at the top-left pixel and ending at the bottom-right. Each colour used must have a unique 'code' to describe it, and the more colours the more complex the code. On the Amiga and other 16 bit machines, 4 bits are usually used to define this code. In binary, this equals 16 unique colours chosen from the 4096 available and these are kept in a 'table' or register of the colour palette currently in use. With some hardware and software tricks this number can be increased to 32 or 64: above this the 16-bit bus cannot normally cope.

In HAM mode, 6 bits are used to define the colours. The first 2 – the 'significant' bits – can have 4 binary values, 00, 01, 11, or 10. If the value is 00 the next four bits define one of the 16 'normal' colours in the register. These can be used anywhere on the screen without causing problems. If the value is one of the other three possibilities, 01, 10, or 11, the colour of the pixel is instead derived from that of the one before it. Now the colour is the same except that one of its RGB components is different – 01 changes blue, 10 changes red and 11 changes green. The remaining 4 bits define the value of this changed component.

In effect this means that if 2 very different colours are to be adjacent there must be a 'fringe' 2 pixels wide between them. For example between Black(000) and White(15,15,15) will be Red(15,0,0) and Yellow(15,15,0) unless white is one of the 16 'register' colours.

It is this fringeing that is the great limitation of HAM. Nevertheless careful choice of the register colours can almost eliminate the effect and several sophisticated programing tricks have been developed to overcome it though the application of these slows down operation. The latest versions of both programs are very much faster, mostly because of the extensive use of machine code.

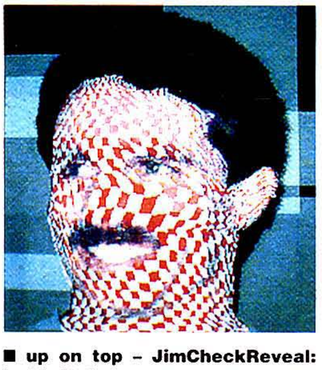
let alone decent brush transformations, limits its versatility. The lack of control over the degree of dither and smoothing, the awkward magnify mode and the clumsy sizing and rotation are also signs of lack of sophistication; there is not even a warning when you use an 'occupied' filename! I want to like it, but... is this really Version 3 of the program?

Photon Paint 2 is now without doubt the most powerful and comprehensively equiped HAM painting system for the Amiga. It has almost every tool you could wish for (it is always possible to think of SOMETHING else, like anti-aliased Bezier curves).

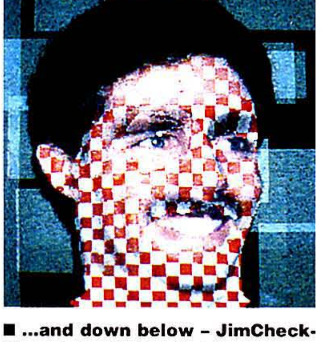
BUT it is still infuriatingly slow (as a comparison with *DigiPaint* shows) and the toolbox still shrinks to almost impossible dimensions in Interlace mode, but it stands up there with *Deluxe Paint III* as one of the best in many ways. ■

was just a matter of clicking on the Scissors icon then on the Repeat icon. Any action can be repeated in this way.

Overall a comparison of the two approaches to Mapping is a bit like the difference between a manual and a fully automatic camera. An automatic camera produces excellent results every time at the expense of versatility and spontaneity. A manual camera allows your own creativity to come through but also allows you to make frequent cock-ups!



■ **up on top – JimCheckReveal: in *DigiPaint*...**



■ **...and down below – JimCheckReveal: in *Photon Paint*...**

Although it is not so good at the more formal, geometric Surface mapping effects, *DigiPaint* has a versatile way of doing mapping that is more effective for irregular objects. By carefully selecting the degree of Warping and following the exact edge of the face, the check pattern and green scales are quite accurately mapped to the approximate contours. The process is enhanced by using a degree of transparency so that the original shading shows through. The final effect is rather more twisted and 'messy' than the *Photon Paint* version but the results are still pleasing.

Photon Paint maps onto irregular shapes using Contour mapping. This mathematical technique can produce some really spectacular results with brushes following every contour of an object, but it uses ray-tracing algorithms and is therefore extremely slow. The *Photon Paint* version of JimCheckReveal shows something of what can be done with Contour Mapping. The check pattern is wrapped onto Jim's face following every contour, distorting the pattern and shading the hollows to emphasise the effect. The area around the bridge of his nose shows the contour effect best. Although the images used to illustrate mapping are a little extreme, the same process can be used to apply pattern to a plain garment or wood-grain to a sculpted object. ■





■ **JimGreenScales: in *DigiPaint* above top, *Photon Paint* above bottom.**

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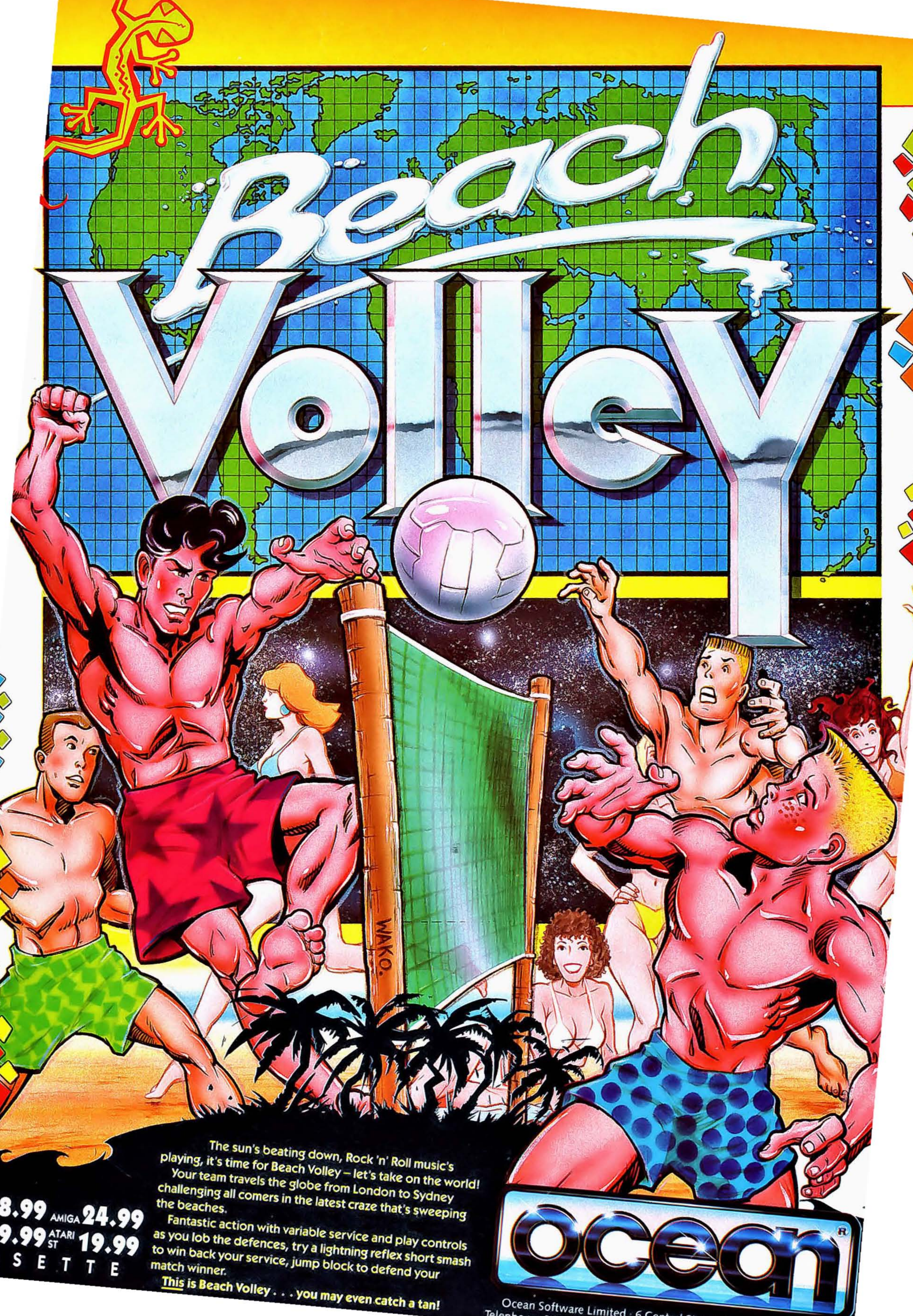
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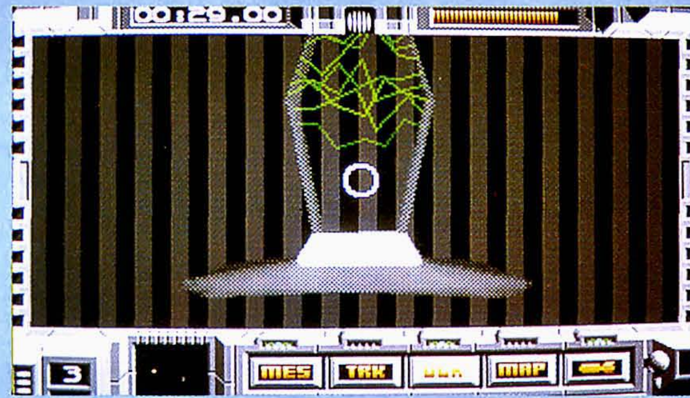
WAR

THE MIST CLEARED. For the first time since the war began, the two forces made visual contact. They waited. Before the initial shock had fully died, an order came through for the fatigued and battle weary reds: 'Attack the blues' left flank'. They did. Unfortunately, the result of the attack was never known because the general was summoned to more important theatres: the mother-in-law had arrived and the plug had to be pulled on the Amiga.

Armchair generals have plenty to keep them busy this month, with the Wargames special: as do fans of almost any other type of game. There's no less than four coin-op conversions and a host of original games including the stunning Interphase and the controversial Shadow of the Beast. Turn the page, and have fun!



■ When you're running low on energy seek out one of the power units (there's one on each level of the computer) and dock with it...



■ As long as you're inside, you're regaining energy. Unfortunately, you can only use a power unit once because it destroys itself afterwards.

INTERPHASE

IMAGEWORKS £29.99 ■ Mouse

The future is, and always has been, an interesting place. It's not unreasonable to assume that in the not-too-distant future, the likes of you and me will find we have more time on our hands away from work: and it's not too unreasonable to assume that we'll be spending our increased leisure time in what would now be considered bizarre and unusual ways.

Imagine a machine like a compact disc player, on which you play not music discs, but discs of the most fantastic dreams imaginable: where you can experience the smell, the sounds, the taste and the touch of any fantasy you like.

That's the foundation of Imageworks' latest 3D romp, in which you play the part of the recently-fired dream-maker Chadd, and must guide your girlfriend through the DreamTrack Corporation High Security Building and retrieve the master recording of your last dream. Why? Well, not everything will change in the future, it seems: corruption looks likely to still be around. Dreamers like Chadd are often showered with gifts from companies in the hope they will dream about them and encourage anyone playing the dreams to buy their products.

That's all pretty harmless, but recently Thought Adjustment Seminars were introduced where Dreamers were 'adjusted' to the 'correct' state of mind. And Chadd has just realised that the subconscious political brainwashing which really takes place at these seminars has turned his last dream into a potential lethal weapon, which could destabilise and undermine the minds of the youth of the Western World.

Using a home-made hacked modem lead, Chadd has linked up to the security computer and is preparing to guide his partner through the many levels of the building to retrieve the master disc stored on the top floor.

Interphase takes place in two parallel worlds: the real world of the building and the abstract world of the computer system controlling security. There are two main displays in the game: a 2D map for each floor of the building, showing the position of the girl and any obstacles, such as doors: and a 3D representation of the world inside the computer, seen through Chadd's eyes. Progress is made by Chadd flying around the computer, altering anything that hinders the girl's progress.

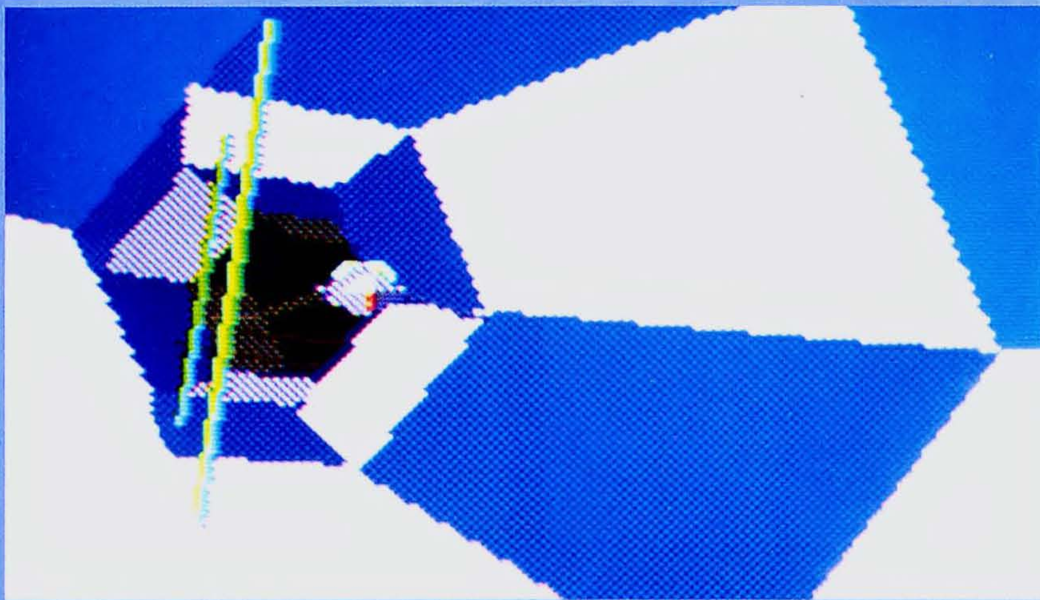
The abstract world inside the computer is made up of several layers which you can pass between by flying through coloured tiles (the layers wrap round for each floor) and on each layer there are various structures representing doors, surveillance cameras and other things that are present in the real world of the building. Suppose the girl arrives at a door in the building that's locked. She'll send a message to Chadd informing him, so that he can call up the map display, see



■ That toilet-like construction is a generator for the computer's internal defence craft, which come after you with a vengeance. Destroying the actual craft is simple enough with your front-firing gun, but...



■ ...to destroy the base you will have to hit it with one of the homing missiles that you carry.



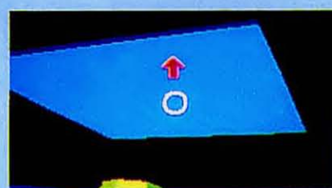
■ Flying through the tunnel which connects the floors. Avoid bashing into walls or you'll lose energy.



■ Zoom in and lock onto a door...



■ ...follow the direction arrows...



■ ...through the coloured tiles...

where she is, and home in on her. Then he can follow direction arrows that will appear on his HUD whenever he's locked onto something, until he finds the door. He simply has to blast it to open it, and the girl continues on her merry way.



■ That green triangle is the girl. She's stopped for some reason and is sending you a message.

Obviously the computer is trying to do a good job of keeping the building safe, so there are various security droids around that Chadd can do little about, except keep them away from the girl. Droids become activated when the girl passes in front of a camera that's on, or when she passes over a pressure pad in the floor. As soon as a droid catches up with the girl it's game over time. It's also game over when all Chadd's energy runs out through crashing into too many structures or by taking too many hits from the various craft inside the computer.



■ It does look rather as though this is where you come in...

Fortunately, there are ways to top up on energy, but it's never easy: especially when you've let reserves get perilously low! The easiest way to deal with the enemy craft is to find where they're coming from and destroy the base with a well-aimed missile: you're armed with missiles and a weaker front-firing gun when you're flying around. Get the girl to the top floor, retrieve the master disc and you've completed the game.

GRAPHICS AND SOUND

The graphics throughout are great. Everything moves quickly and smoothly and you're left with the impression that there really is a 3D world in there. The sound effects too are great. Overall this is the standard of graphics and sound that we should be expecting from current Amiga games.

JUDGEMENT

Interphase is complex and intriguing to start with. Once you've played a couple of times, though, you'll have the hang of it and will be able to understand what's going on. Then it's a case of carefully planning the route and dealing with the hazards as you come across them. The levels get progressively harder so it's going to take you a while to complete and if you like games that require a little brain power, you'll have a lot of fun along the way. ***Andy Smith***



■ ...to the correct floor...



■ ...locate the door (green box)...



■ ...and shoot it to open it...



■ ...bingo! One less obstruction!

GRAPHICS	9
SOUND	8
INTELLECT	4
ADDICTION	7
OVERALL 88%	

THE RATINGS EXPLAINED

GRAPHICS
Good graphics are an important part of any game: if the power is there, it should be used to the full. Both static and moving graphics come under scrutiny in this rating, but remember, graphic wonders alone do not a great game make...

SOUND
With stereo capabilities the last thing you want to hear are Spectrumesque beeps, right? Title tunes and effects all add atmosphere to a game and good sound can greatly increase your enjoyment.

INTELLECT
How much real thought do you have to put in to play the game? Just because a game's mindless doesn't necessarily mean it's bad, but a game with a high Intellect rating says immediately you'll need to think to gain maximum enjoyment.

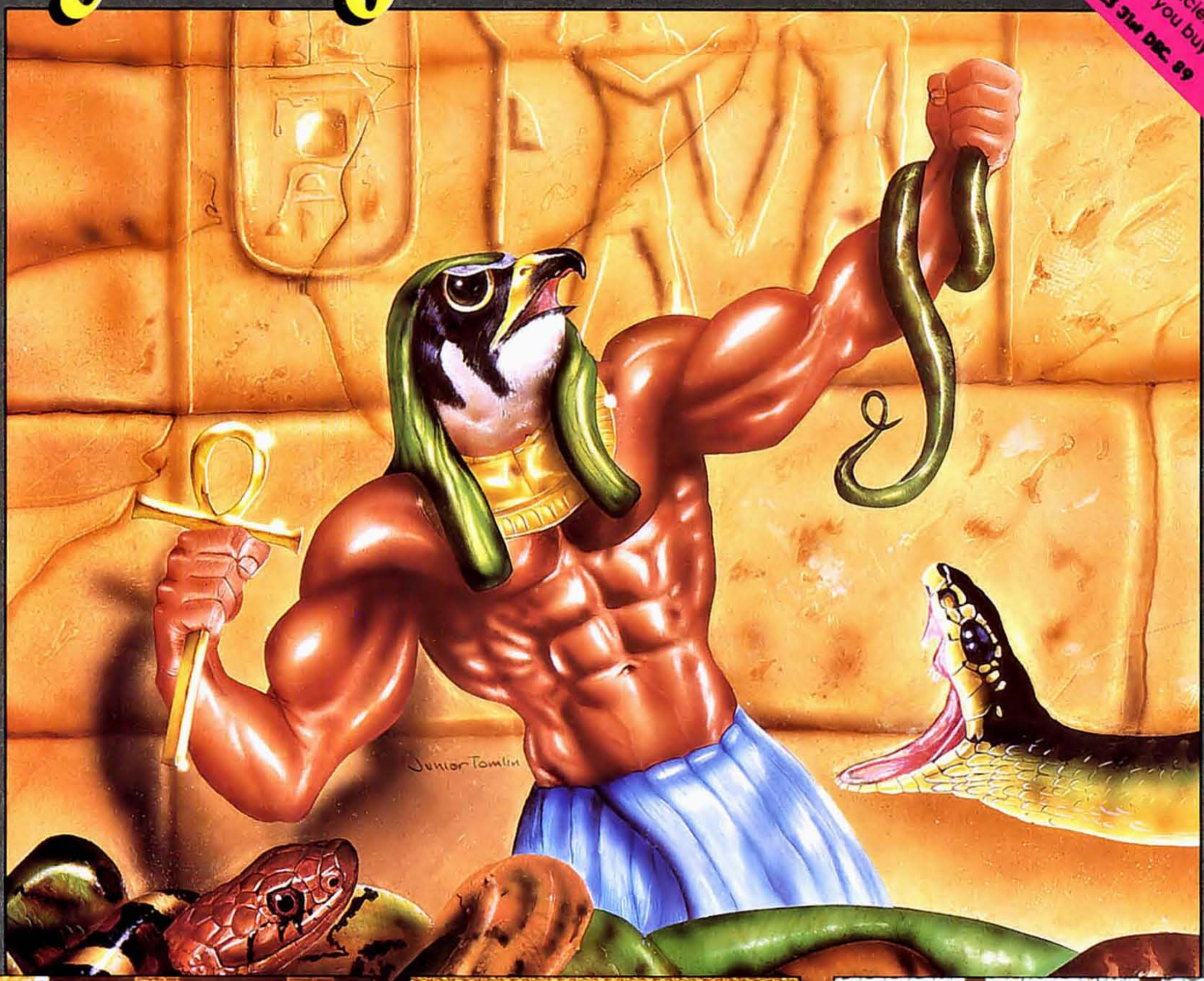
ADDICTION
How easy is a game to pick up and play? How much sheer fun will you get from it? Will you keep coming back? Important questions, all answered by a look at the Addiction rating.

OVERALL
A percentage mark that takes into account all the ratings, plus added extras like price, packaging, documentation...

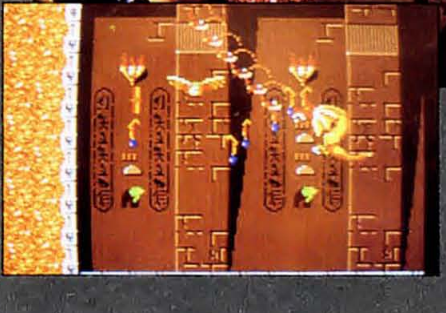
THE TEAM
Andy Smith, who was with *ACE* right from Issue One, is a 'twelve-hours-a-day' games fan and one of life's natural games-players. He loves any type of game, be it a shoot-em-up, strategy game, arcade adventure... *Bob Wade* started reviewing with *Personal Computer Games* and has worked for *Zzap!64*, *Amstrad Action* and *ACE*. There's no-one in the business with a better idea of what makes a game.
Mike Dunn has been reviewing games for many years and is not afraid to speak his mind. He's done sterling work for us this month – Andy Smith's been on holiday again – and we have every confidence in his abilities. You should too. *Pat McDonald* has been Technical Editor on our sister magazine *Amstrad Action* for years now and an Amiga owner for nearly as long. When it comes to the pixel battlefield, Big Pat's a major force to be reckoned with.

Eye of Horus

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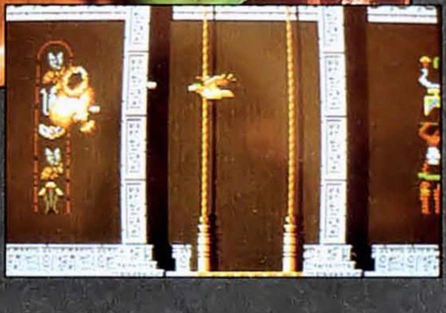
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Atari ST Screen Shot



Atari ST Screen Shot



Atari ST Screen Shot

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DYNAMITE DUX

ACTIVISION £24.99 ■ Joystick



■ **Argh! The cloud monster! First you have to shoot the clouds that are spinning around the middle one, but look out for the lightning.**

Bin and Pin, the Dynamite Dux, are playing a sweet innocent kiddies' game with their friend Lucy when the evil Achacha The Great (the Great What?) materializes from nowhere and kidnaps Lucy! Argh! Shock! Horror! The heroic, daring dux take off after them immediately.

There are six levels to fight through before they can get down to the serious business of rescuing their friend. Eighteen different types of creature oppose them, ranging from the Sumo Pig to the Boxing Crocodile! Bin and Pin start the game unarmed (having to rely on their own boxing skills for self-defence) but dotted along the way are loads of weapons, ranging from simple stones and bombs all the way up to flame-throwers and missile launchers



■ **No, the duck isn't usually spiky-haired: he's just been hit!**

(have you ever seen a blue duck carrying a bazooka?) Naturally, these weapons vary in usefulness: the bombs are great for long-range firing, but they're pretty useless on anything nearby, and the flame-throwers are brilliant to fry enemies at close quarters, but rubbish for anything else.

A great two-player mode is included: you can beat each other up if the action dies down temporarily! Bonus levels have been included to boost the content that bit more and, naturally, every level has a huge fat mega-nasty just make sure things don't get too easy.

GRAPHICS AND SOUND

Playing *Dynamite Dux* is rather like watching a cartoon: the graphics are bold and bright, and the tune that plays throughout is the sort of bouncy jolly stuff that generally accompanies cartoons. Visually and sonically, it's a very enjoyable game. Colour is used liberally without being garish, and although there's nothing special about the animation, everything has an air of clever design. The range of enemy characters is varied, and some of them are quite amusing: I'm afraid, though, that 'cute 'n' cuddly' is very much the order of the day!

JUDGEMENT

Disappointingly, despite the light-hearted nature of the game's presentation, it lacks an essential element of addictiveness. Though quite playable, it's a bit easy to get through the first couple of levels, and as a result, they become quite tedious when you play through them again and again. Lastability rating, therefore is fairly low. This lack of challenge on the early levels reinforces the general feeling that this game isn't really aimed at the dedicated arcadian or shoot-em-up freak, but rather at the younger, less experienced player. It's an accurate conversion: unfortunately, though, the original wasn't all that hot. ***Mike Dunn***



■ **The big fat fire monster in Level One takes some killing!**

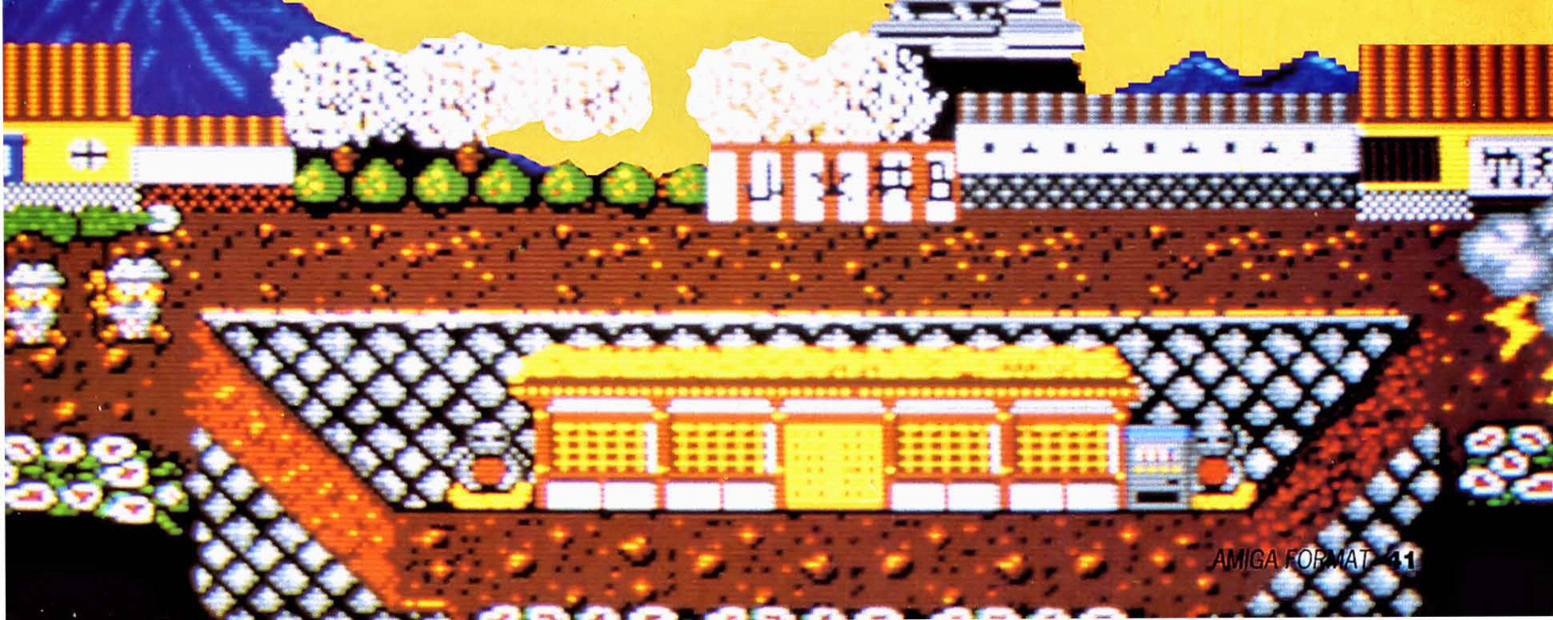


■ **Whack! The evil little nasty gets a big bunch of fives.**



■ **Armed with the flame-thrower, duckie goes to fry meanies...!**

GRAPHICS	6
SOUND	7
INTELLECT	2
ADDICTION	7
OVERALL 64%	



SHADOW OF THE BEAST

PSYGNOSIS £34.95 ■ Joystick

As a nipper, it's not the most pleasant experience in the world to be kidnapped by a bunch of wicked mages and taken away for a life of slavery and misery, serving the evil Beast Lord.

Still, that's happened to you. And to ensure faithfulness to the master, the mages have imposed years of hypnosis and brainwashing. As a reward for all those years of service, they have turned you into a powerful, agile and swift half-human creature with few feelings and little compassion, especially for the humans who must often be herded together for the ritual sacrifices.



■ Smash all those pillars and collect the bottles to gain some much-needed extra strength.

Until one day there you are, sitting watching the humans being taken to the altar, when suddenly the face of one particular old man stirs some long-suppressed mem-



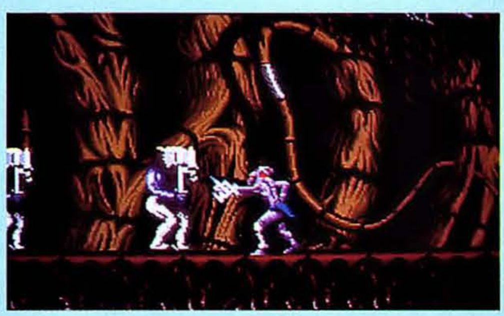
■Getting in is terribly easy, but getting out is something else!

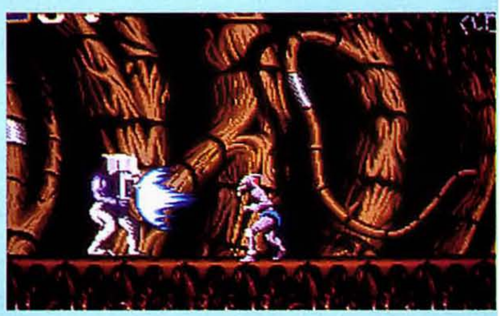
ories. But it's too late for you to act when it dawns on you that the little old man is in fact your father. Now you've turned against your masters and are determined to destroy the Beast Lord himself.

The game starts with the player controlling the creature: the idea is to guide him through the 350 screens of (mostly) horizontally-scrolling platform action until the final showdown with the Lord. As you might guess, the Lord has discovered your rebellion and has instructed the mages to send all manner of 'orrid creatures against you. Contact with any of these creatures causes you to lose energy (you start with an energy count of 12) until death forces a restart of the game. There are also some nasty traps that tend to sap energy, including huge spikes that come up from the ground and (later) down from ceilings. To counter the creatures all you need is a well-timed and well-aimed kick or punch: and to counter the traps



■ Should you manage to duck the flames and punch the blue ball held by that strange creature, above, enough times to smash it, you gain a power-up in the shape of a super-powerful punch, as seen below.





all you need is a little bit of good timing and some good jumping.

Unfortunately, not all the creatures are so easily dealt with. Some of the monsters can only be killed after you've collected an extra weapon and many of the traps will only be avoided by walking straight into them and then remembering where they are on a later try. Just as muchto the point, progress in the game is not always straightforward either. Sometimes keys have to be found to unlock certain doors, and the keys are always miles away from the door! Things aren't all so black though, there are the extra



■ You've found the key – now you just have to find the right door!



■ On the surface again. Those spikes can prove lethal, so take care.

weapons for a start and there are the occasional bottles of potion that can be picked up to restore either some or all of your energy. Make it to the Beast Lord and you'll find that your troubles are only just beginning.

GRAPHICS AND SOUND

The animation, the sprites, the backgrounds and the parallax scrolling are all superb. This is the sort of stuff we want! Add some great, atmospheric music and effects and you're left with one of the best-looking and -sounding games to have appeared in recent months. A true audio-visual treat.

JUDGEMENT

What the graphics and sound promise, the gameplay doesn't quite match. It's tough and will take you a long time to complete, but the actual game style is very old and very uninspired. Still, make some progress in the game and you'll find it gets very addictive, as you struggle to make it to the next screen or solve the next puzzle. There are, however, some very annoying features, not least the fact that you've only the one life: which means you have to restart from the very beginning every time. Plus there's the frustrating end and beginning sequences which are inescapable.

Andy Smith

BEAUTY AND THE BEAST

Psygnosis have been at the forefront of good-looking and sounding Amiga games for well over two years now, ever since *Barbarian* first appeared and wowed the public, if not all the reviewers. One of the biggest criticisms of the game was the fact that it was little more than an old 8-bit style platform game with 16-bit graphics. Unfortunately, *SOTB* still suffers to a greater or lesser degree from the same problems. The game may be massive, it may have fantastic graphics and sound and the puzzles may be more complex, but it's still just building on ideas that are five or six years old, and not stretching them any further either.

Then there are the simple frustrating features that could so easily have been avoided, like the unavoidable deaths and the tedious end and start of game pauses. More time and effort on the fundamental design would have turned this outrageously good-looking game into one that was an absolute corker to play as well. As it is, the effects are of such a high standard that they just show up the basic design's failings. To cap it all, the asking price of £35 is way over the top, even with a 'free' T shirt.

GRAPHICS	9
SOUND	9
INTELLECT	5
ADDICTION	7
OVERALL 78%	



■ Careful timing of jumps is needed to avoid both spiders and claws.

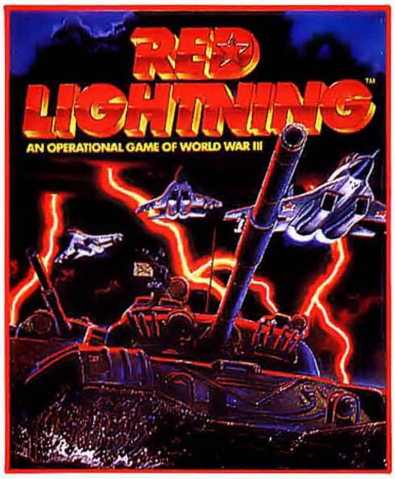


■ More timing problems occur in getting past these pulsating eyes...



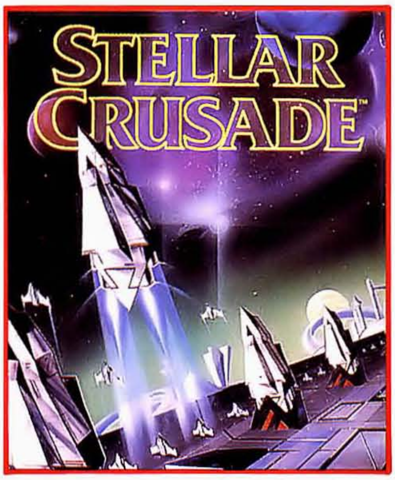
■ Manage to avoid them and you're left with horrible, dangerous bomb-dropping dragons to contend with.

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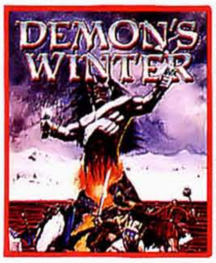
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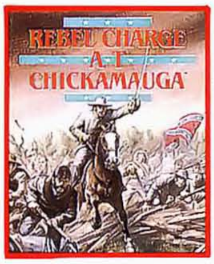
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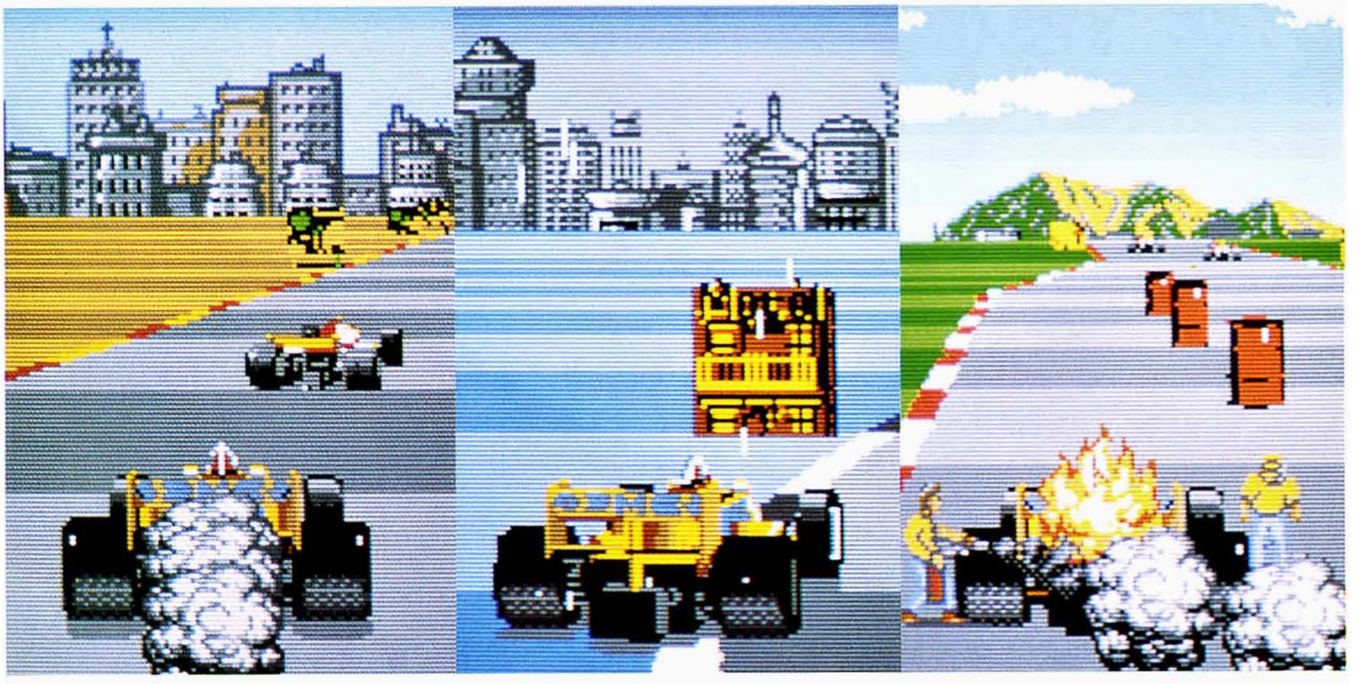
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VIRGIN £19.99 ■ Joystick

CONTINENTAL CIRCUS

A game like *Continental Circus* is really welcome after spending the first part of the morning in traffic jams! Fast, powerful Formula One cars roaring around a famous motor racing circuit. Ah, there's nothing quite like it to release tension.

In *Circus*, the player views the car from slightly behind and above, a style which is popular in arcade racing games although it detracts slightly from the realism. Thankfully you don't have to bother about revs or oil pressure in *Circus* and there are only two gears (fast and very fast!) The only time that engine temperature becomes important is when it starts to catch fire!

Naturally, the first priority is finish the race with your car intact, but to progress to the next track you have to achieve a qualifying position. As well as this, there's a time restriction. At the top of the screen, along with your gear and speed indicator, is the countdown timer which indicates how much time you have to reach the next stage of the track.

Other drivers present something of a problem: they get in the way! (Even when you're apparently in the lead: yes, I got to first place and there were still other drivers on the road in front.) Normally on racing games, you can manage to leave any overtaking for the straights: not so on *Continental Circus*! The tight qualification times mean that you have to take every opportunity to overtake, and if that opportunity comes around a corner at 400kph, you have to go for it!

Smashing into other cars either writes off your vehicle completely, or, if it's a less serious knock, sets the engine on fire, in which case you have to get into the pits pretty quick! After the first level, it starts to rain occasionally; this can really mess up the car's handling. Unfortunately, it doesn't seem to affect the other drivers, so things get really tough.



■ Oh dear. The car's on fire and you have 17 places to make up!

GRAPHICS AND SOUND

There isn't all that much you can do with a racing game, in terms of graphics: these are fast and smooth, and colour is bright but not overdone. The backgrounds are OK, although the sense of travelling at 390 kph (which is about a kilometre every ten seconds) doesn't really come over! Sound is a bit poor, the FX are limited and there's only a few short little tunes to pass for music, but in this sort of addictive, fast game, you don't really need a symphony.



■ The pre-race track view, which allows you to check out where all the tough corners and straights lie before you even start a race.

JUDGEMENT

The first phrase that springs to mind is "just another racing game": there aren't any great features or super-slick ideas, but it is simply a good version of a classic game. For the most part, *Circus* is challenging, but without being frustrating, although there is a tiny bit of annoyance when the car stops just before the finish line! There's plenty of tracks, the presentation is adequate, and all the playability and lastability which made this type of game such a success in the first place have been preserved perfectly. The game is neatly programmed and, although it could be described as unoriginal, is still well worth a peek! ***Mike Dunn***

GRAPHICS	7
SOUND	5
INTELLECT	2
ADDICTION	7
OVERALL 71%	

THE EDGE £24.99 ■ Joystick

GARFIELD THE WINTER'S TAIL

Garfield (the world's fattest and laziest cat, as if he needed any introduction!) has dozed off in front of the fridge. The cold is having some effect on his sleep, as he begins to dream of Northern Italy, and the Alps. As any glutton knows, Italy is where lasagna comes from, and on the other side of the Alps is Switzerland, where they make chocolate!

Naturally, both of these fat-foods feature in Garfield's dream. In the first section of the dream, Garfield is skiing down a hill with Odie, because at the bottom of this hill is the lasagna-making factory (a dream of dreams for all self-respecting carbohydrate-consumers!) There are logs, trees, stones and all sorts of other things in the way, which the fat cat must avoid or jump, as well as ski-jump ramps which must be negotiated successfully. Right at the bottom of the hill, there's an extra big ramp, which Garf has to fly off to take him to the beginning of the second stage: inside the lasagna factory itself.

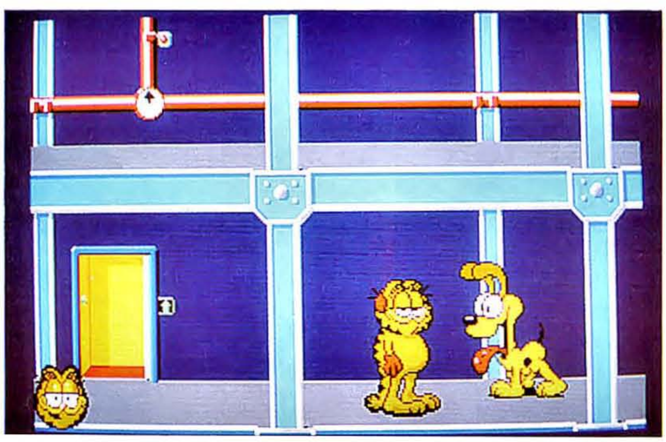
Having fallen through the roof of the factory, Garfield now gets a chance to increase his energy level. When he plonks himself down in front of the production line, waggle the joystick like mad to make him eat faster. The more he gobbles, the better he feels! When Odie stomps in to announce dessert-time, it's off in search of the chocolate factory.

In here are loads of elevators, escalators and poles connecting the platforms. Garfield has to direct the flow of chocolate through the red pipes, so that the pipes dispense chocolate to all the mechanical chickens throughout the factory. The direction of flow though the pipes is shown by the arrows which appear at the pipes' connections. Near to each of these connections is a little red button, which when pressed will change the direction of flow. After all the chickens have been fed, Garfield can enter the control room, where the mythical chicken that lays the chocolate eggs lives. Unfortunately, when he gets there, he discovers that the chicken has escaped.

The lake is frozen over. Garfield, feet clad firmly in a pair of skates, takes off over the ice to follow the chicken's chocolate footprints (which, of course, he eats on the way). He must avoid the holes in the ice (watch out for Odie, who has a saw and uses it!) and collect any bits of food. Once he gets to the other side, it's into the Swiss Village to find the chicken, at last.



■ **And it's Zubbrigen on the right... Well, actually, it's Garfield on the right and Odie on the left: the first stage of *The Winter's Tail*.**



■ **First floor for junction boxes and pipelines. The sneaky look on Garfield's face indicates he's about to give Odie a good kicking.**

GRAPHICS AND SOUND

What can I say? The graphics in *Winter's Tail* are fantastic: they're perfectly coloured and amusingly animated, and the characters are much brighter and clearer than they are in the Daily Mail! Sound is good too, with an excellent tune that plays throughout. Absolutely brilliant presentation.

JUDGEMENT

Once again though, good presentation is let down by a poor game design. The first section (skiing) is OK: it lacks a lot of content, but it looks good and plays reasonably. Unfortunately, the Lake and the Chocolate Factory are both awful; the former is unplayable, the latter too boring for words. Fans of Garfield with money to spend on cuddly toys and other stuff of dubious usefulness might find it good value, but any gamesplayer is going to seriously question the importance of buying this. Not recommended to anyone but the most die-hard fans. ***Mike Dunn***

GRAPHICS	9
SOUND	8
INTELLECT	5
ADDICTION	3
OVERALL 43%	

PAPERBOY

ELITE £19.99 ■ Joystick

Remember this being one of the classic machines in the arcade, years ago? And remember the 8-bit conversions, years ago? So why on earth has it taken Elite so long to come up with the Amiga version? You might well ask.

The paperboy of the title must to deliver the "Daily Sun" to all the subscribers in the street. Some houses (the grey ones) don't subscribe, so they shouldn't get a delivery! Extra points can be gained by getting the paper in the mail-box, breaking windows, riding over flowers, and generally being a nuisance. Kids playing with radio controlled cars get in the way, men digging up the roads, joggers, car drivers, skateboarders and generally every sort of intelligent (and unintelligent) lifeform is out to make the delivery job more difficult for the deliverer.





■ **Look out for the lawnmowers! Oops, the warning was too late...**

The graphics are OK without being brilliant, and the sound is fairly average. *Paperboy* is a very old game (five years now), and it shows through. An essentially mediocre product, and not the sort of thing we expect to see nowadays. ***Mike Dunn***

GRAPHICS 5 / SOUND 4 / INTELLECT 2 / ADDICTION 6 / OVERALL 41%

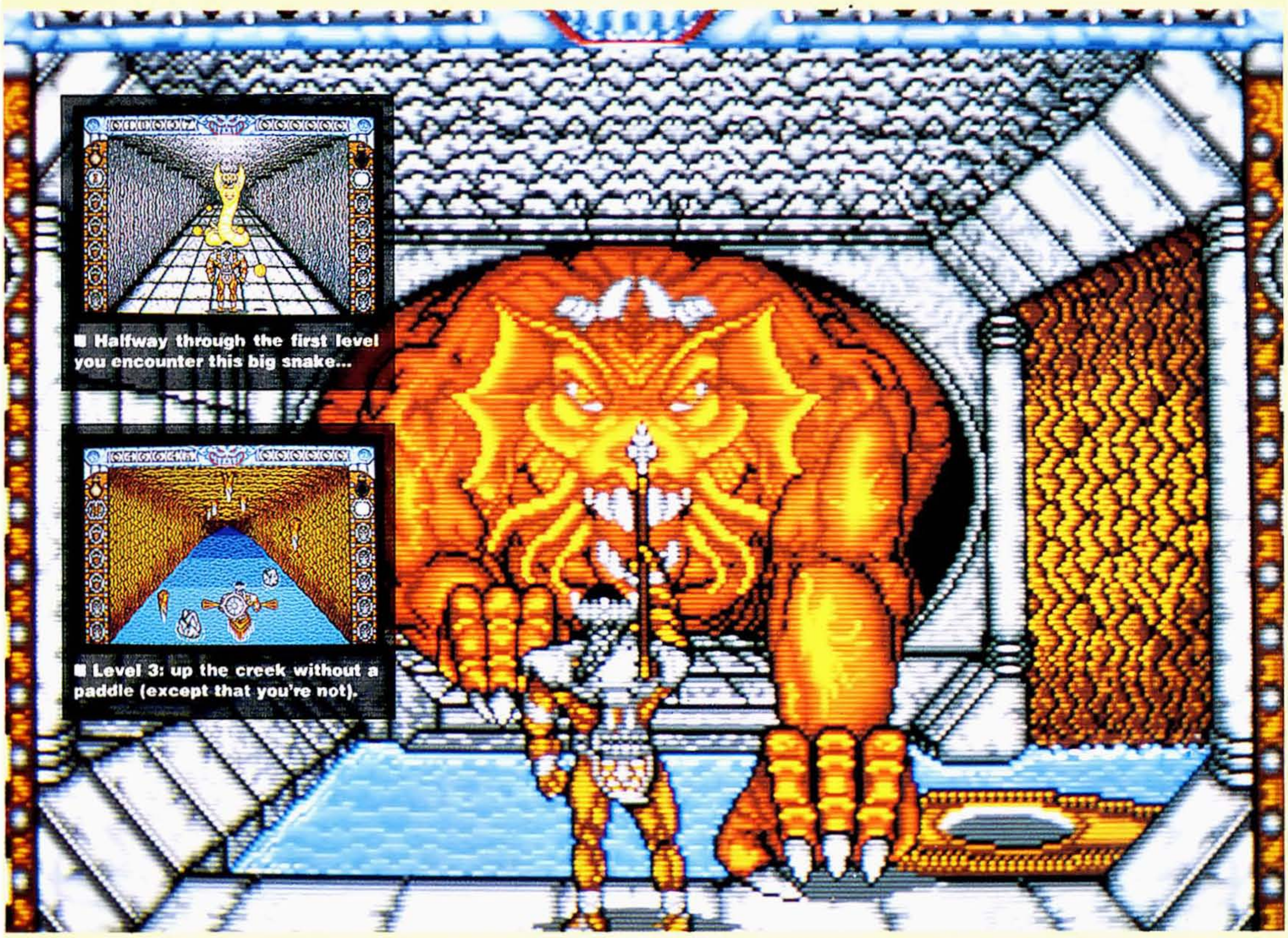
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■ Level 3: up the creek without a paddle (except that you're not).

DELPHINE SOFTWARE £24.99 ■ Joystick

CASTLE WARRIOR

Fifty years ago, there was a battleground which lay between two nations. Edelwulf The Great and his army fought it out with their opponents and triumphed, Edelwulf taking the crown and uniting the two countries. Peace and tranquility and all that malarkey reigned and everything was hunkydory. Eventually, Edelwulf died, and was succeeded by his eldest son, Edelred The Good. He was a pretty decent bloke as well, ruling with a fair hand and not imposing too much tax on the population.

However, not everyone in the country was happy. Zandor, an evil wizard, had been banished to a castle on the farthest part of the bleakest corner of the kingdom. He was a fairly grumpy sort of guy, so he decided to get rid of Edelred and seize the kingdom for himself.

Must be a pretty hot wizard, evil or not, because he managed to get himself inside the castle's defences and poison the King's food. Things are looking grim. The King is ringing death's doorbell, and no-one knows of an antidote. No-one, that is, except Zandor. Edred The Brave (that's you!) has volunteered to find Zandor and force the cure out of him.

There are six levels to hack your way through before you can get the antidote safely to the King. The first is the Corridor Of Death leading to Zandor's castle. You must slash your way though a variety of bloodthirsty beasts, including a huge golden snake and a massive green giant (except this one isn't selling sweetcorn) both of which can only be destroyed by returning their own fireballs. At the end of the tunnel is the Dragon Olisos, who guards the river. This unpleasant character spits fire at you, inbetween attempts to catch you in his wicked, sharp claws.



■ The blue monster that guards Zandor near the end of the game.

Next you have to negotiate the underground river. Avoid the rocks and the stalactites which fall on you. At the end of the the river is the Jibba, who is tackled in the same way as the dragon. Penultimately you have to confront Zandor, who sits on a throne throwing spells. Kill Zandor with the sword and collect the antidote, and then you can set off home to save your father.

GRAPHICS AND SOUND

Generally, the graphics in *Castle Warrior* are fine: the tunnel scrolling is a bit poor, but everything else looks good. The dragons are impressive, the animation is smooth, and colour has been used to great effect. Sound is even better. Edred's footfalls are convincing, the rest of the FX aren't anything special, but this is made up for by a brilliant tune.

JUDGEMENT

Unfortunately, good looks and good sounds aren't everything. Despite the slick presentation, there's quite a bit missing from the gameplay. The first level moves annoyingly slowly: you find yourself instinctively pushing the joystick forward to move things along faster! The second level looks good, but unfortunately the sheer lack of content makes it very boring after a while and since the fourth level is almost identical in every respect except the graphic, the same applies. This rather lowers the lastability of the game, and as such decreases your value for money considerably. Still, it's well presented, and if you place importance on high-class graphics and sound you'll find it more enjoyable than would someone who couldn't care less as long as it plays well.

Mike Dunn

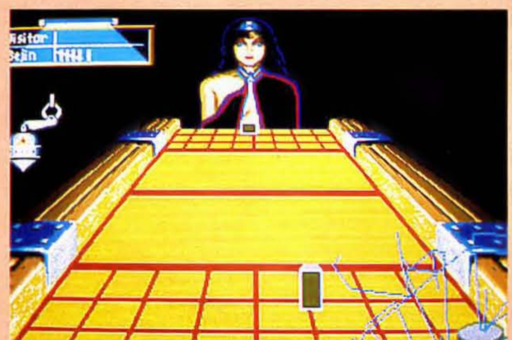
GRAPHICS	8
SOUND	7
INTELLECT	2
ADDICTION	5
OVERALL	**53%**

SHUFFLEPUCK CAFE

DOMARK £19.99 ■ Mouse

It happens to all of us (well, it happens to me an awful lot!): it's very late at night, and you desperately need to use the 'phone. Unfortunately, the only 'phone for miles is in the back of a crowded bar, and the drinkers at the bar don't look too friendly.

Well, that's the situation you're in in *Shufflepuck*. There's absolutely no way out: you have to use that 'phone. The unpleasant patrons of the establishment will only let you pass if you prove yourself by playing all of them at the old bar game *Shufflepuck*. For that matter, they'll only let you live if you prove yourself at *Shufflepuck*!




■ Phwoar! The seductively sexy (ahem!) Princess Bejin slams a shot past you on the left, while on your right, you knock a shot past Vinnie The Pig. Note the adjusted size of the paddle and puck on the left.

Everyone must have seen this game at one time or another. A small disc called a puck is placed on a table, and two players have "paddles" which they use to hit the puck to the oppenent's end of the table. The aim is to whack the puck so fast that the other player misses it and it goes over his side of the table. Simple, you say? Yes, it is.



■ Note the divider in the middle of the table: this makes the game even harder (which is probably why the player hasn't scored yet!)

There are nine players in the bar: eight aliens and an android. These range from the wimpy, bespectacled "Skip" (no relation, thank you very much; anyone who suggests a similarity between myself and him will regret it!!!!) and the droid DC-3, who are both fairly poor, right up to Biff Raunch, who is, err... a teensy bit fast.

You can control the size of your paddle and the responsiveness of the puck: having a super-fast puck is fine when you're serving, but wait until you have to try and return it!

GRAPHICS AND SOUND

Shufflepuck has a great tune, and the bar noises are excellent. In-game FX are very limited, but the graphics are as good as they could be: there's only your opponent and the game pieces, all of which are fairly adequate.

JUDGEMENT

Well, *Shufflepuck* is a very good game, as far as it goes, but it doesn't go very far. The content is ridiculously limited. OK, so obviously someone has put a lot of time and effort into making this a polished piece of programming, but most people would expect a bit more than this for twenty quid. Simple and fun, but the simplicity is its downfall. ***'Skippy' Dunn***

GRAPHICS	6
SOUND	6
INTELLECT	1
ADDICTION	5
OVERALL	**49%**

SHINOBI

VIRGIN £19.99 ■ Joystick

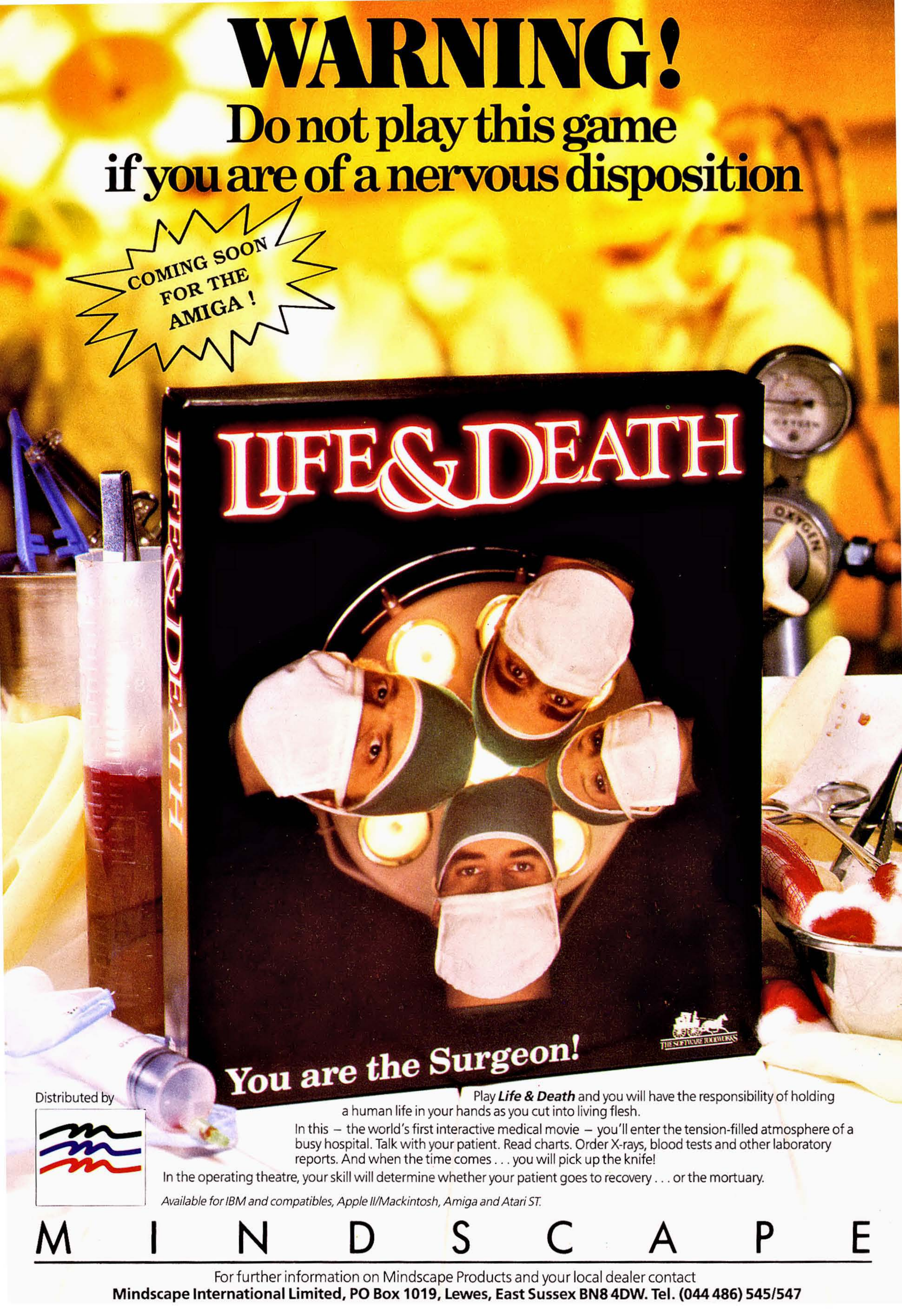
Hmmm. Revenge of the Return of the Ninja's Comeback Part 4, methinks. All the children of the world's leaders have been kidnapped by an evil ninja terrorist group called the Ring Of Five. The leaders want their darling kiddies back safe and sound, so you, the super master god ninja, must take on the might of the underworld and... well, you know the story, we've done it enough times.

Shinobi looks very poor. The ninja is badly animated (his feet move faster than the floor scrolls, so it looks like he's moonwalking!) and the colour looks like it was planned out on a Spectrum. Some bits are OK, like the huge helicopter, but the general feeling is of a badly-designed, badly-written game that both plays and looks in a very dated manner. ***Mike Dunn***



■ The odds are stacked against him, but somehow I suspect our friend the mastergodmegahard ninja might just about prevail!

GRAPHICS 3 / SOUND 6 / INTELLECT 3 / ADDICTION 4 / OVERALL 36%


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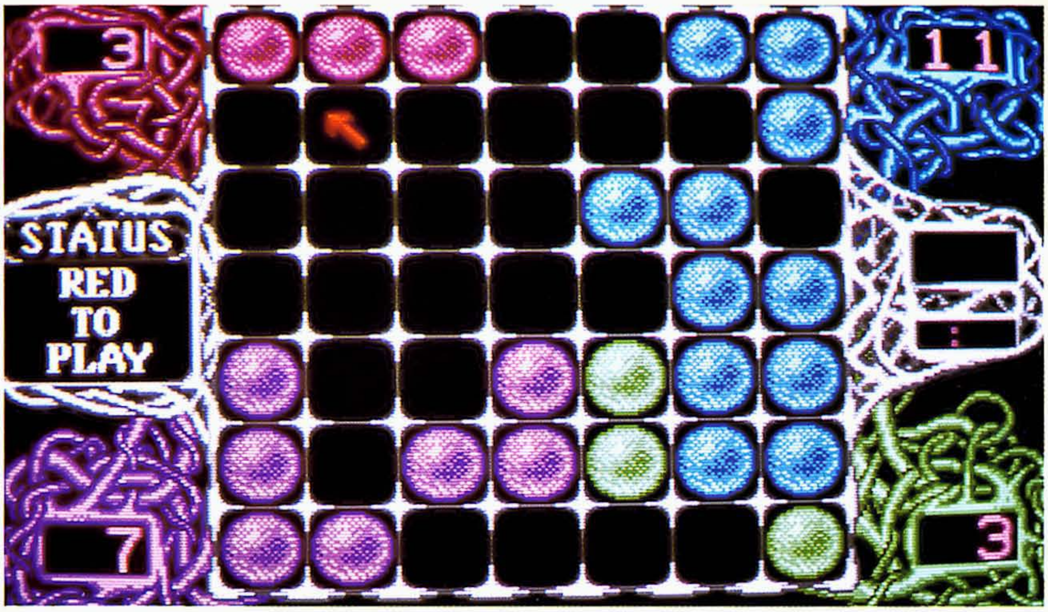
PSYGNOSIS

INFECTION



■ Introducing blocks makes tactical jumping necessary.

16 BLITZ £4.99 (Wow!) ■ Mouse, Joystick or Keyboard



■ Early on in a four player game, blue has established a lead but things change so quickly it could change in just a few moves. Meanwhile, green is on the verge of extinction.

This game should come with a double virus warning, because it's catching. The whole idea is to spread, reproduce, replicate or, to put it another way, infect a playing grid with your blobs before any of the opposition's coloured blobs can do the same.

It's perfectly simple. There's a seven by seven grid with a coloured blob in each corner. The blobs can duplicate into an adjacent square or jump over a square. Thus they can gradually fill in, and move around, the grid. Every time a blob of one colour fills a square next to a blob of another colour it changes the second blob to the same colour as itself. The aim is to end up with more blobs of your colour than the of other player's. In such a way is a great tactical game born.

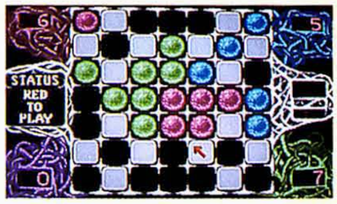
One to four players can take part, any or all of which can be computer controlled. They each start with a corner, with one empty for a three player game and two blobs each in a two player game.

Initially it sounds like Othello (Reversi) but the elements of jumping and reproducing adjacently change the game tactics immensely. One soon learns the basics, but getting to grips with the deeper tactics is tougher and the computer opponents will always put up a fierce struggle, whatever their skill level.

The grid can also be dotted with blocks which cannot be used, once again presenting new tactical problems. There are a series of pre-defined layouts but you can easily create custom ones.

GRAPHICS AND SOUND

The actual grid and blob graphics are very simple, but the way the blobs split and move is satisfyingly gloopy, as is the sound effect for this. The best sounds and graphics are on the title screens. This may seem curious, but the game does not need them and they provide an interesting diversion. You can actually 'play' the title screen as a sort of psychedelic paint palette where you can create beautiful effects. The soundtrack for this is also atmospheric and decidedly conducive to sitting in a dark room playing with colours.



■ Purple has already been knocked out and blue is next.

JUDGEMENT

Infection may be simple, but it is also very enjoyable. It's the sort of game you will keep coming back to for another try, every few days for months and years to come. It's good, but the clincher is the price. At under a fiver it's a real bargain which all gamesplayers should avail themselves of. ***Bob Wade***

GRAPHICS	3
SOUND	6
INTELLECT	6
ADDICTION	8
OVERALL	83%

MYTH

RAINBIRD Free! ■ Keyboard and Mouse

Myth is set in a world of ancient Greek gods, whose existence is threatened by the rise of Christianity. To keep up humanity's faith in the gods, Zeus, the god-in-chief, decides to set them all heroic tasks, just like the good old days. Naturally, you're first: you are Poseidon, the god of the sea (though, incidentally, you can't swim!), tasked with recovering the Dark Helmet of Hades.

The game starts in front of the gates to the underworld. You carry the barest essentials for the task. Exits lead... ahem! Graphics in *Myth* are very good, and the parser is OK, but the real high point of it is the humour. If you liked *Fish!* you'll probably like this, because they're very similar in style: you may even prefer this, it's that good! An excellent adventure. Witty, cunning and just plain good fun! ***Skippy Dunn***



Note: *Myth* is currently only available to members of Rainbird's adventure society Official Secrets. You can join this society by ringing their Sales Hotline on 0279 600204, or by sending a cheque for £22 or your credit card number to... Official Secrets, PO Box 847, Harlow, CM21 9PH. In return, you'll be sent *Myth*, together with another free game, six issues of Confidental (the adventure and role-playing magazine) and membership of Special Reserve, a group which claims to offer the cheapest software service around (normally £5).

GRAPHICS 7 / SOUND N/A / INTELLECT 9 / ADDICTION 8 / OVERALL 87%



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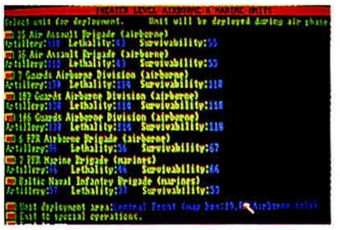


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to your small screen!

Each player has a variety of units at his disposal. These include special operations, aircraft, airborne troops, and the divisions that make up his armies. The military units are represented on the map by markers: red for Pact, blue NATO and white for neutrals.

The units are divided into a number of different types, including infantry, headquarters and artillery, and vary in size from regiments to divisions. Unit markers on the map show both the size and type. I found it irritating that stacked units had blank markers, although the unit names are written below the map. This cost me a few headquarters during the game, simply because I forgot where they were!

The detail on units is superb. Assuming you are examining a division you can find the number of squads, tanks, helicopters and so on within the unit, and the



■ Selecting a unit, from the range of troops at your disposal, to deploy during an air strike.

readiness of each component brigade. While there is no real need for this depth of detail, it does show exactly what sort of casualties you are taking, allowing you to adjust your tactics accordingly.

Each unit is part of a larger command, such as British I Corps or the Soviet 3rd Shock Army. When a unit is selected, a yellow square lights up on all units in the same command. It is important to keep commands together, as only units in the same command can make simultaneous attacks, thus guaranteeing good odds. It took me a little time to get used to this, and when units got lost it took me ages to find their command again.

When playing the game, you're made very aware of just how important it is to marshal your forces in just the right attack and defence formations. There's a lot of subtle variations and options: keep a brigade on full alert, or leave some to rest in case you can advance? This is the underlying, huge strength of *Red Lightning* – the number of tactical variations is staggering.

GRAPHICS AND SOUND

A definite disappointment from this angle. Nothing about the game strikes you as Amiga-like at all. There are some nice touches, in that the plane shapes are displayed, but even then sometimes they bear little relationship to the actual true outline. Sound is nonexistent, which is a crying shame.

JUDGEMENT

If you like shoot-em-ups or arcade action games give this one a miss. If, however, you like detailed wargames then *Red Lightning* has been worth the wait. While this sort of game appeals to a much smaller group of people, those who do have an interest will find it well worth the money. Someone has put a great deal of thought into it, and it really shows: even if there isn't a nuke option... ***Adrian Stewart*** **£29.99 Mouse**

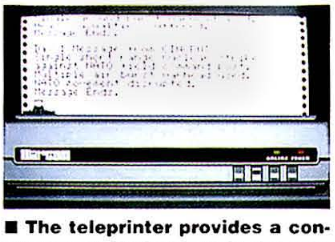
GRAPHICS	5
SOUND	N/A
INTELLECT	9
ADDICTION	6
OVERALL	**90%**

CONFLICT EUROPE

PSS present a disturbing tale of the effects tactical nuclear warfare might bring about in mainland Europe, if the big red button is ever pressed...

It's nice playing God, as *Populous* players the world over will tell you. Here's a similar theme: a wargame where you're commander-in-chief of either NATO or the Warsaw Pact just after the start of World War III. The Soviet hordes are sweeping the pitiful western forces before them, and the only balancing factor may prove to be that of battlefield nuclear weapons.

At first, you are presented with a map of western Europe. The game is played purely at Corps level, which means all the



■ The teleprinter provides a constant record of events in the war.

little units like regiments, battalions and divisions are lumped together into one very impressive composite playing piece.

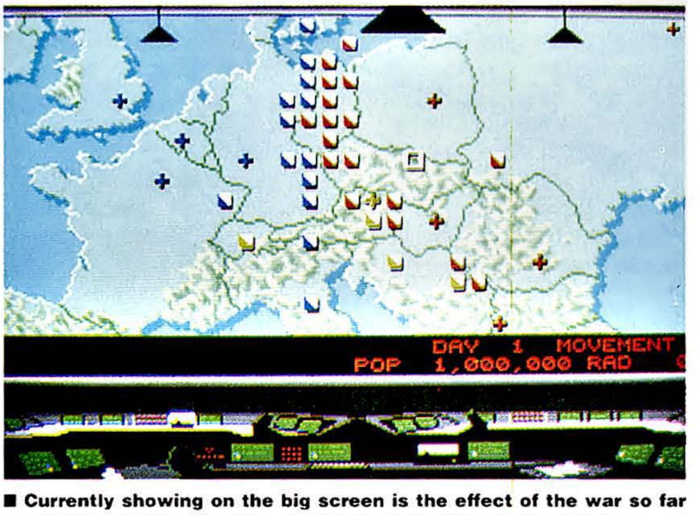
A unit's statistics are composed of armour, air power (local stuff like helicopters and Harriers, presumably) and supplies. In assault or defence, these will be reduced: and, needless to say, only the US Corps can assault a Pact frontline unit and hope to win. The Italian Corps is, I'm sorry to say, the standard joke.

The map isn't hexed: which simplifies play but does mean that travel rates (one square per turn in anything other than mountains) are not very realistic. If NATO doesn't hold a solid line, then Pact units just bypass them diagonally: and if they can reach the German/Dutch border, they've won!

Each turn is separated into two days. Every so often you gain reinforcements to assign to units. These nearly all go to your understrength units, beefing them up for the next struggle, but they can replace battle casualties. If a unit runs out of supplies, with no further ado it is annihilated.

Some function keys call up various information terminals: these contain hints as to how best to proceed. Information includes general war news, reinforcement schedules, population and radiation readouts. An interesting one is the diplomatic screen, where you can issue threats, make ceasefire proposals or just surrender (and forfeit the game).

You receive similar messages, and not just from the enemy: the Swiss premier was most upset



■ Currently showing on the big screen is the effect of the war so far on civilians in the war zone. As this includes the whole of Europe...

when I dropped a few nukes on his precious mountains. Some people don't realise that there's a war on!

Orders can be issued through similar displays. Airpower can be set to various missions, air superiority being the overriding factor: whichever side has this chooses to move first. Other missions include 'Assault Breaker' and 'Iron Snake' (the latter being the destruction of enemy railways, delaying reinforcements).

Then there's the nuke terminal. Having entered the pass code, you can select various 'response' fireplans: these differ in multi or single warheads, air or ground burst, and neutron weapons (very effective against armour). Or you can make the first strike, and become what can only be described as a bloodthirsty butcher whose name will live in infamy. Especially if you lose.

The names of these strikes indicate the effectiveness of the strike: from Sharp Stick to Dirty Harry. The Pact fireplans have more suitably Russian names. Of course, using these weapons creates monstrous civilian

casualties: and then there's the retaliation. Five different openings are available. The first is a simple line-up, one against the other.

Others include a NATO without the good old USA, both sides being unprepared for war, and also both sides having a Star Wars anti-ballistic missile system. It can't be very effective: global thermonuclear war still broke out, ending the game. My own fault for invading Rumania I suppose.

This is the tightrope you must walk, especially if you play NATO. Sooner or later you're forced to go nuclear. When you're the Pact, how do you respond? Sometimes the computer makes appalling mistakes, using conventional rather than nuclear retaliatory strikes. Most of the time though, it's Mutually Assured Destruction. There really is no alternative.

GRAPHICS AND SOUND

All the graphics and sound in the game are up to Amiga standard, although none of them break new ground. Maybe using HAM pictures for the static screens would have impressed me more. The samples are used effectively, especially for the nuclear strike sequence. Not a straightforward big bang, but a low, threatening rumble.

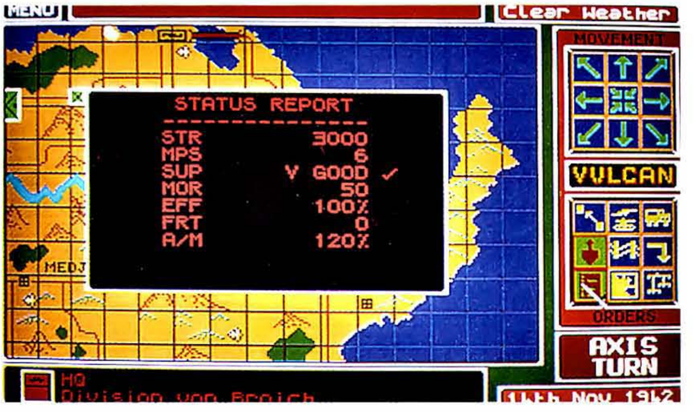
JUDGEMENT

I'm quite fond of the game. There are better computer wargames on eight-bit machines, but the gentle charms of loosing off an atomic barrage are simply irresistible. I doubt that the interest level is enough to keep propeller-heads like me engrossed for very long, but for normal, clinically sane human beings it's a very pleasant game. ***Pat McDonald*** **£24.99 Mouse and Keyboard**

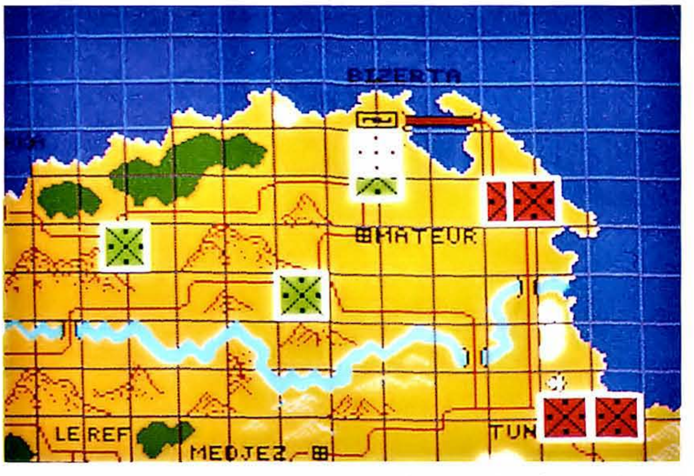
GRAPHICS	7
SOUND	6
INTELLECT	6
ADDICTION	5
OVERALL	65%

VULCAN

Cases Computer Systems in Afrika



■ The Axis forces take the chance of a brief break in occurences to check on the current disposition of their various troops.



■ Meanwhile, the allied troops are planning an offensive via the 6th Commando Battalion, who are currently holding the city of Mateur.

RT Smith is the most notable programmer in the field. His system of wargames has seen coverage on most popular micros: but how has he used the unique capabilities of the Amiga in *Vulcan*, set in the second half of the North African campaign of World War II?

There's a very nice picture which is used to decorate the front end. You can select a one or two player game, and choose to play the Axis (German and Italians) or Allies (Brits, Yanks and, er, French). For non-participatory fun, make the computer play itself.

The scenario is well chosen. Tunisia from late 1942 to mid 1943 was the centre of the Axis attempt to cut the Suez Canal, and then capture the precious (but largely untapped) oil wells of the Middle East. There's ample opportunity for manoeuvre and counter-thrust, as well as more static warfare favouring the defender.

In 1942, the Torch landings in French-colonized North Africa opened the way for a back-door attack on Tunis and Bizerta, the main Axis supply depots from Europe. Rommel was busy in a confrontation with Montgomery in Egypt, which ended with a nasty scrap at El Alamein in 1943.

So, the idea is for the Germans to survive (hold either Tunis or Bizerta) and for the Allies to take control.

There are five options available in which the history before the battle is subtly different. There's the seizure of Malta by the Axis, Bone Airfield being occupied by German forces, Rommel being annihilated in Libya (which is what Hitler ordered him to do, fighting in Libya taking more time) and also the French colonies remaining neutral rather than joining the Allies.



■ The Axis has great air power, so they air-strike frequently.

A system of icons is used to order the various forces about. The unit sizes vary from HQs (typically 300-odd men) to regiments (3,000) up to French divisions which have 6,000 men in. Morale and fighting strength are not overly keen in these formations, but boy are they impressive when they are on the move.

A description of the icons: 'movement' will make a unit spread out and move cautiously (there's an option to keep the enemy movement secret). 'Assault' is to deliberately attack a position, taking heavier casualties but also handing them out in fair fashion. 'Travel' is totally non-combative, sticking to roads and shooting along at speed.

If a unit moves, you can order it to dig in. This takes a whole turn, but the unit suffers less damage from attacks, especially from tanks. If dug in, a unit can fortify its position, and this can be accumulated over several turns to make a static strong point.

You can get a report of the unit, plus a quick look at what terrain it's on. You can move units onto the same square (although not more than a division can stack together) and also split them off to send them their separate ways. Units can run out of supplies very easily if you're not careful: they draw these from their headquarters which in turn must get them via the nearest road. But if stomachs and magazines are full, crashing through massed enemy positions with a front-line tank battalion (maybe 180 tanks strong) is such fun!

GRAPHICS AND SOUND

The graphics used in the game are not striking. There's a very nice pic on the front end, and that's about it. A more dramatic use of the Amiga is in air strikes, when the hexes around a given target are cratered to the accompaniment of suitable amounts of noise.

Another use of sound is for ground attack. There's one sample for each side's infantry and tank units: the length of the sound is an indication of the damage handed out or taken. Nice touch.

JUDGEMENT

All in all it's a creditable effort that will have you waging war on your Amiga for a good few months. The computer opponent is pretty good, but a human opponent is best: if you can avoid looking at each other's moves!

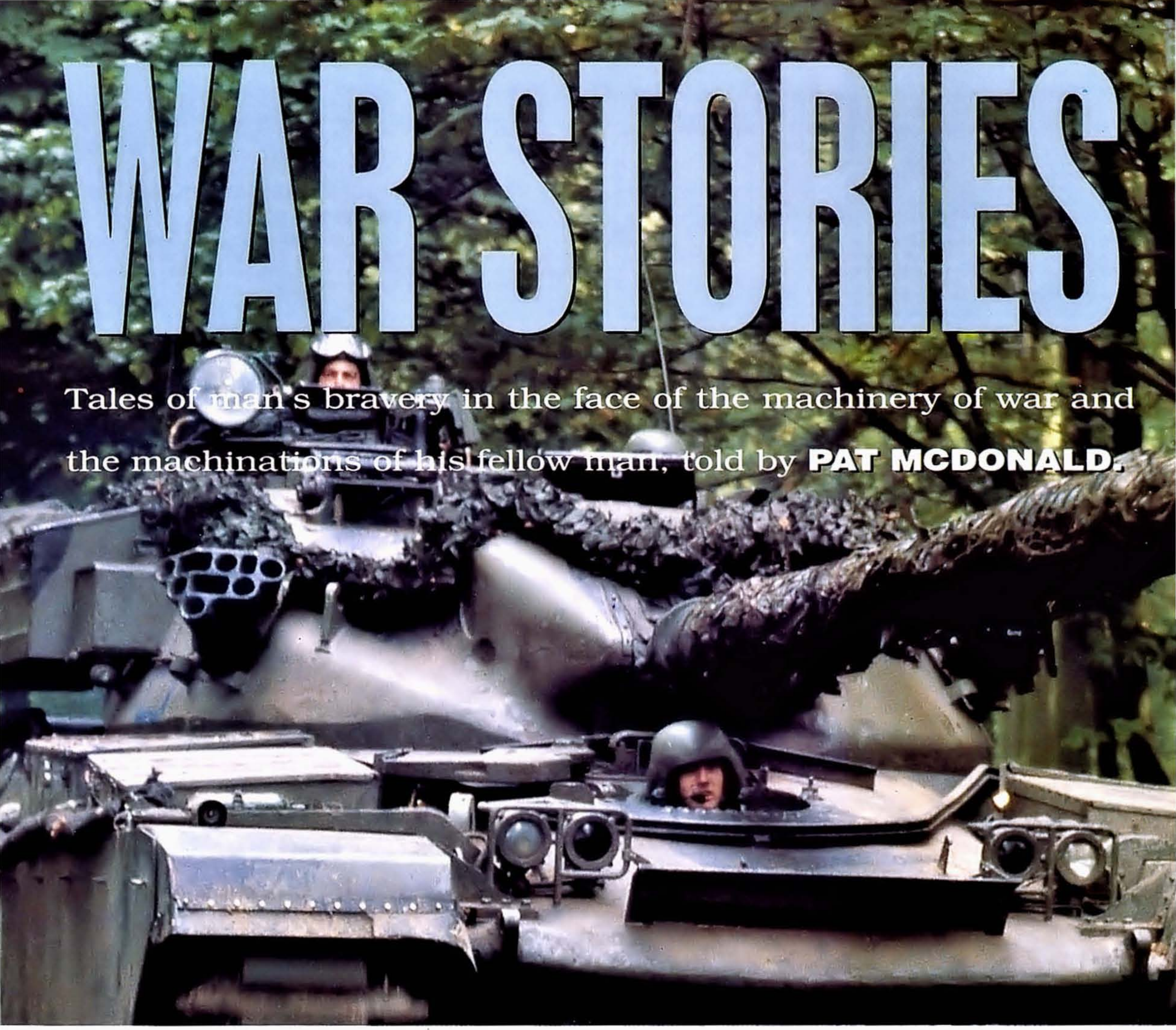
Pat McDonald **£19.95 Mouse**

GRAPHICS	6
SOUND	6
INTELLECT	9
ADDICTION	8
OVERALL	83%



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WAR STORIES



Tales of man's bravery in the face of the machinery of war and the machinations of his fellow man, told by **PAT MCDONALD.**

RED LIGHTNING



Modern tactical warfare from Strategic Simulations Inc

It is the late 1980s, and the unthinkable has finally happened. The Russians are hammering across the North European plain. Can NATO stop the red hordes, or is Europe condemned to life under the Soviet iron fist...?

Red Lightning is a highly-detailed, operational-level game set during World War III, focusing on the Central European theatre of operations. You can play the Pact or NATO in one or two player games. There is a comprehensive rule book that even includes a bibliography! I would recommend studying the rules, because they give some useful hints. The playing area covers Europe from France to Poland, and from Denmark in the north to Austria in the south. Actions in Norway and Iceland can affect both NATO and the Pact, so they are included as 'off the board' regions to which you are also capable of assigning troops should you so wish.



■ Note the typical board-game style hex map. The screen overlaid on this is showing the map of current supply lines for both forces.

Map size is 54 by 50 hexes, with each hex representing an area of land 25 kilometres across. Hexes contain a specific terrain type, ranging from sea to mountains. The map is easy to read, although national boundaries aren't shown, which would be useful.

The playing window covers an area of fourteen by seven hexes, and can be scrolled along hex rows. When you call up the strategic map it not only shows the military situation, but also allows you to zoom in on the bit of the main map that you want, which saves hours of scrolling around.

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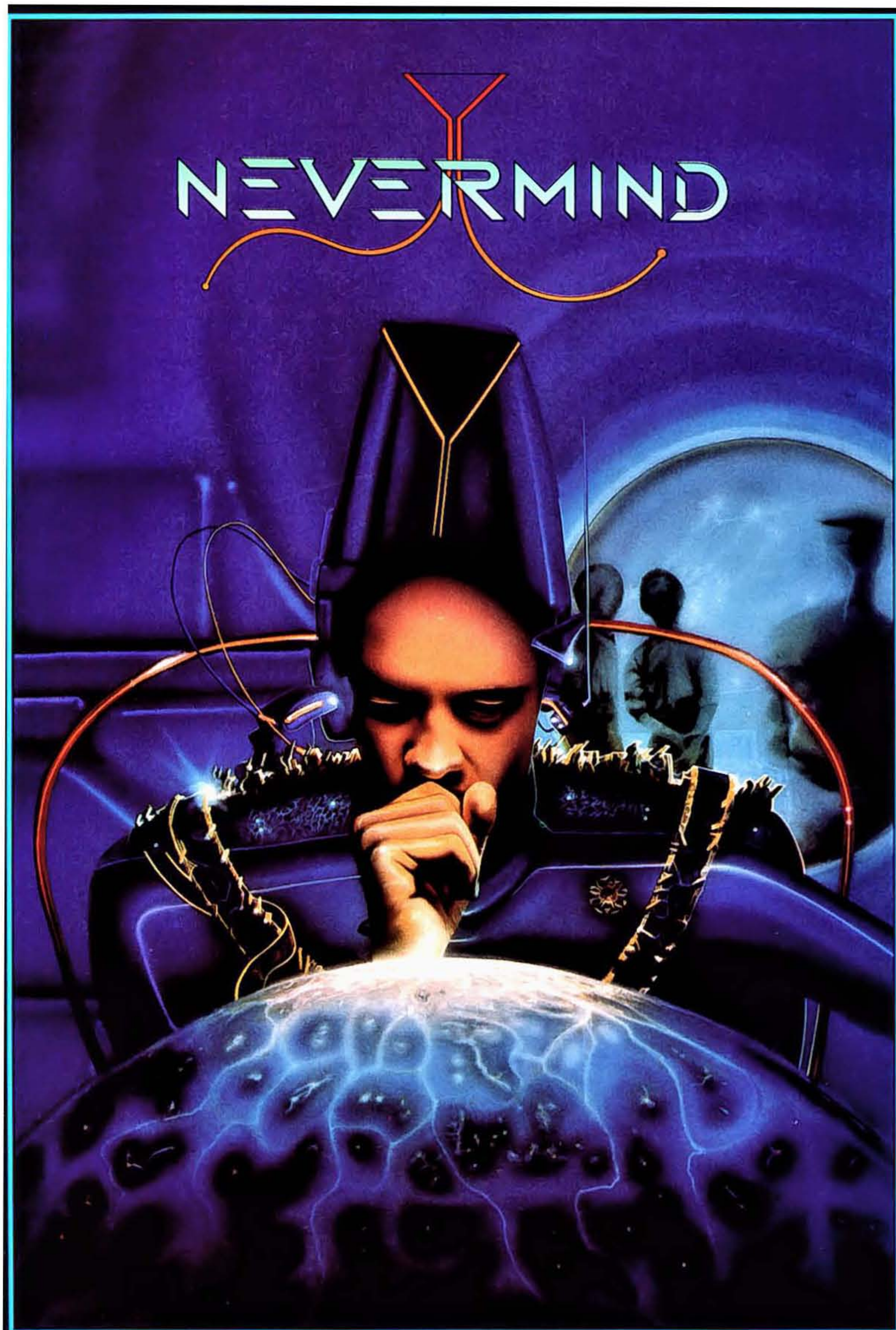
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PIXEL PORTRAITS

Nothing is safe when you have a video camera, an image digitiser and an Amiga. **RICHARD MONTEIRO** grabs everything he can.

Even if you're a very skilled graphic artist, you've little chance of producing near-photographic quality images on your Amiga using conventional graphic techniques. The Amiga's HAM (hold-and-modify) graphic mode means 4096 colours can be displayed simultaneously, and overscan means that a resolution of up to 768 by 480 is possible. While the power to create stunning images is offered by Commodore's machine, the feat is well beyond anything living (and that even includes you, Jason).

Just try pumelling 368,640 pixels into anything plausible. And then try deciding which hues from the 4096-colour palette to use. No chance, pal. Not in your lifetime.

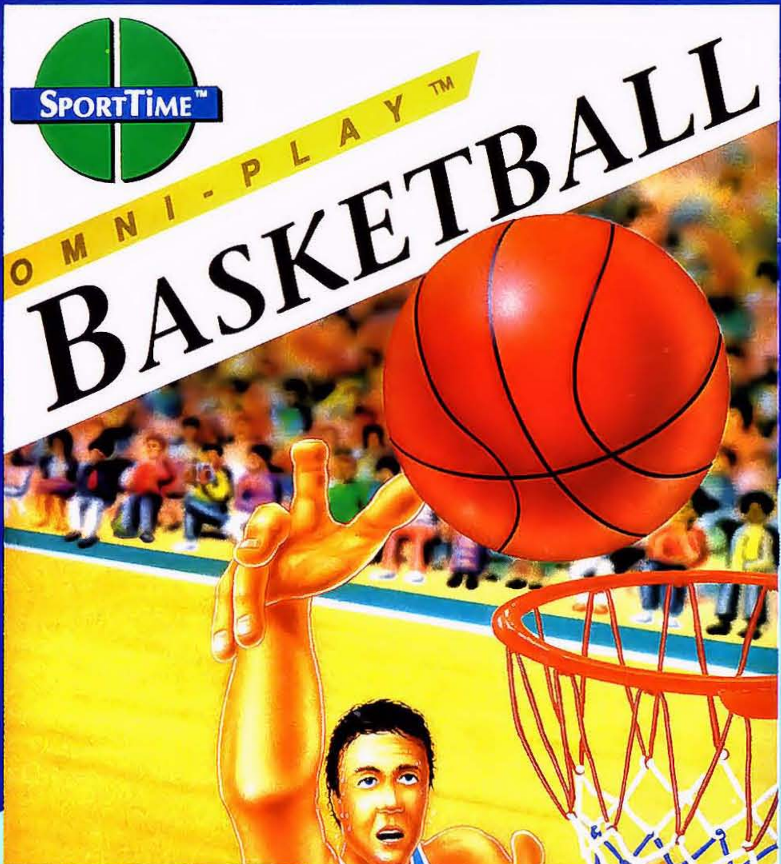
So where do those sensational 4096-colour picture come from? You know the ones – they're life-like, detailed, almost real. They're the sort of images you could never produce using a traditional art package.

In seconds a device called a video digitiser can snapshot an image from the outside world and convert it into something that can be displayed on the Amiga's screen. The images produced with a video digitiser or image grabber are known simply as digitised pictures. There's nothing special about these pictures, if you exclude the fact that they look so realistic: they're no different from other Amiga screen formats.

There's nothing mysterious about the way images are grabbed: a video camera or video recorder does the seeing and sends pictures to the digitising hardware. The hardware converts the incoming signals into something recognisable by the Amiga: that is, numbers. Ultimately these numbers appear as pixels on the screen. Depending on the sophistication of the hardware in use, digitised images may appear in monochrome, grey scales or colour. And the time to generate these images varies from several minutes to tenths of a second.

Once an image is in the Amiga's memory, all manner of editing can take place. It is, after all, just a screen picture. Most conventional art packages will let you load these pictures and hack about with them. And what next? You could write demos using digitised screens: many already exist in the public domain. Or you could use these near-perfect graphics in games. The start-up sequence of this month's most stunning game, *Interphase*, uses grabbed images.

But enough of this idle chatter! You want to know what a digitiser can do for you. Read on...



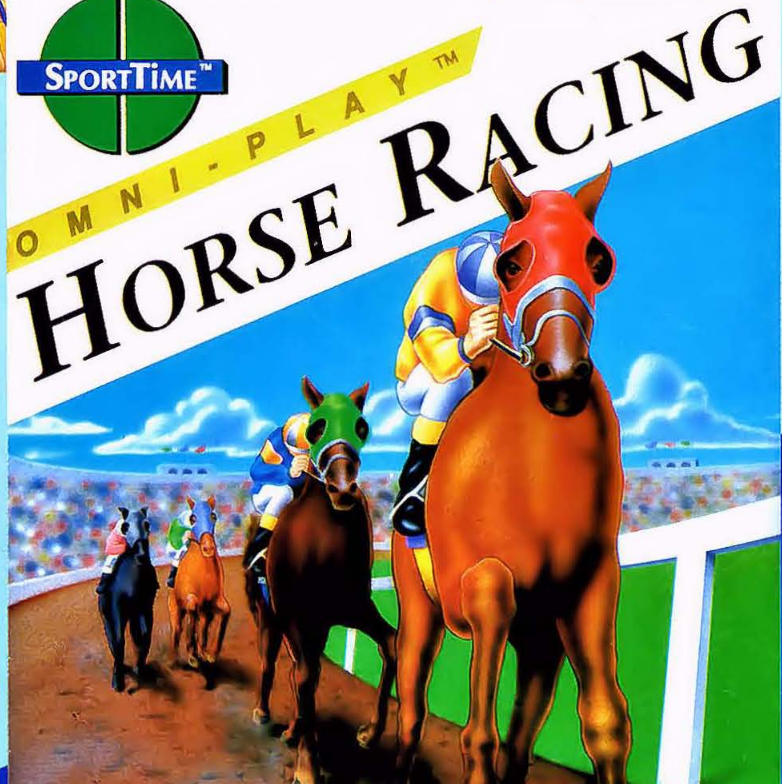
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- ★ Up to 4 players.
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Screens pictured are from Amiga version. Other computer versions may vary.
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■ The main picture shows the basic grabbed image – the portions above showing four of the six different effects [clockwise from top right – threshold, multiple, pixel and negative) which can then be aplied to that image using Videon

VIDEON

Don't believe the hype! Regardless of what the manual and packaging claim, Videon cannot grab colour or monochrome images from any old composite video source. Video camera and still subject: yes. Video recorder: no. Videon is not a real-time digitiser, a picture having to be built up over at least 30 seconds, so there's no way it can grab a recognisable image from a video recorder. Sure, you can hit the pause button on the VCR, but unless you've got equipment costing double your Amiga setup, you're going to get horrible tear lines across the screen.



■ The complete Videon kit

Videon plugs into the parallel and monitor sockets of the Amiga, but also accepts the monitor socket directly. A 15V power pack provides the gas. A couple of knobs on the grabber's front panel let you switch the screen display to Amiga output or video output. Three dials allow you to alter the contrast, brightness and colour level of the incoming signal.

All Amiga modes are supported including high resolution, interlace, halfbrite, HAM and overscan. Two digitising speeds are offered: fast and slow scan. These produce, roughly, passable and good results respectively. Fast scan takes from 30 to 60 seconds to produce a picture, and is expensive memory-wise. Slow scan... well, it's slow all right, but no extra memory is required for any of the modes as the image is built up directly on screen.

Six different effects can be applied to a grabbed image:

■ Pixel produces a mosaic effect. Each pixel can be magnified from two to six times.

■ Solar brightens the picture to produce an over-exposed photograph result. The quantity of over-exposure is determined by you.

■ Multipic fills the screen with a reduced image. The number of tiny pictures allowed ranges from four to thirty-six.

■ Zoom magnifies a given area of the grabbed image by a pre-determined amount.

■ Threshold changes the brightness of particular areas. The brightness level is selectable.

■ Negative changes the picture into, logically enough, its negative.

An excellent feature offered by Videon is surface mapping. Essentially the software lets you wrap a digitised image around a solid shape. The resulting 3D image can look astounding. Six types of solid, ranging from a pyramid to a cylinder. are offered. The solid can be rotated in any of its axes, have its dimensions altered, and be magnified or reduced. Wonderful.

Of all the digitiser software reviewed, Videon's is by far the best. Perhaps not in terms of features, but for easy guruless operation it is superb. There are no awkward requestor boxes and no crashes when memory runs out. Why can't all Amiga software be this friendly?

Videon is seriously let down in one area: its manual. The manual really is naff – worse even than SuperPic's. And that's going some. There is arguably more information on the packaging than there is in this dismal eight-page affair.



VIDEON
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DIGI-VIEW GOLD

Whoever would have thought that NewTek could have fitted all the components of a video digitiser in a box smaller than a cigarette packet? It's extraordinary.

Digi-View is a combination of hardware and software that enables you to transfer high-quality colour or monochrome images from a video camera to your Amiga. Colour images are captured using a colour seperation process. A colour filter wheel (supplied) is mounted in front of a video camera's lens. Three snaps of the same image must be taken, one through each of the red, green and blue filters. Meanwhile, the subject must be stationary.

Because the process invovled in grabbing an image takes several seconds (stretching into minutes), only inanimate objects or very still subjects are suitable for grabbing. Naturally, grabbing real-time from a video recorder is out. ▸

• The Digi-View hardware slots into the Amiga's parallel port and apart from a Video-In jack is featureless. A female-to-female RS-232 gender bender is needed to use the digitiser with the A1000.

The software comes in two versions: American NTSC and UK PAL. At least 1Mbyte of memory is required to use the PAL software,


■ Newtek's offering

but even then you won't be able to use high resolution modes.

All Amiga graphics modes are supported including interlace, high resolution, overscan, HAM and even extra halfbrite. The number of colours used in each mode can be determined by you. This is useful for saving memory and changing the number of bit planes assigned to a picture. Altering the bit planes can be handy, say, for converting a 4096 HAM image to a *Deluxe Video*-compatible eight-colour picture.

Because image grabbing is a three-pass process as described above, Digi-View works with either a monochrome or colour video camera. However, a monochrome camera produces better results.

As long as you have a good camera, decent lighting and a motionless subject, the images possible are of very high quality. The software employs dithering techniques to enhance HAM images – the results can be staggering. On the against side, a ridiculous amount of RAM is required for grabbing anything but the lowest resolution images – and it's all too easy to jolt the camera or subject in the time it takes to digitise a picture.

EXTRA, EXTRA!

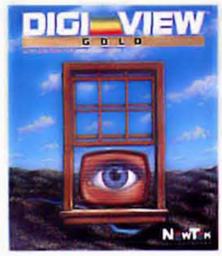
Because Newtek is such a caring company – and wants to make even more money out of you – it recommends several items of hardware to make digitising easier and faster, and results even better.

The fist is Digi-Droid, a motorised filter wheel for attaching to a video camera. The advantage of this is that you don't have to manually move anything attached to the video camera. You can't jolt what you don't touch.

Then there's a copy stand for your video camera and lights. This really is an essential purchase if you're going to use the digitiser seriously. A clamp on the stand secures the video camera and directional lamp holders mean you can position light sources in the best location.

Finally, there's the Base-Band Distribution Amp which lets you plug Digi-View and the camera into the monitor at the same time. This means you can monitor what the camera sees on the Amiga's screen before digitising it.

HB Marketing on 0895 444433 distributes Digi-Droid for £69.95 and the copy stand for £59.95. For details of the Amp write to NewTek (115 West Crane Street, Topeka, KS 66603, USA).



DIGIVIEW GOLD
£149.95 ■ All Amigas ■
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SUPERPIC

So it costs a lot... it also does one hell of a job and comes with stacks of features. How's this for starters: real-time colour and mono digitising (that's one frame every 50th of a second or one interlaced frame every 25th of a second); 192K frame buffer expandable to 512K; a screen display that automatically shrinks to available memory; edge detection


■ Indy grabbed!

and image manipulation tools; time lapse image capturing; brightness, contrast, colour and hue controls; monitor view switchable between Amiga, TV/video and framestore; built-in genlock allowing Amiga graphics to be overlaid on video.

SuperPic has leads which plug into the parallel and monitor ports of the Amiga; a socket on the digitiser accepts the monitor cable which usually slots into the Amiga's monitor port. Finally, power is supplied via a 15V power pack.

Because SuperPic offers real-time digitising, anything offering 75ohm composite video output can be plugged in: video camera, video recorder or even TV with the appropriate digital output.

The size of screen to be digitised is determined by the software. You have full control and can grab from a few pixels square to well beyond recognised overscan resolutions. There's little point in going beyond the Amiga monitor display dimensions: it only wastes memory. Colour or monochrome grabs can be made in 16, 32, HAM and HAM plus modes. High resolution and interlace modes are supported, but you can't take full-screen grabs because the framestore only comes with enough memory to store a non-interlaced colour picture. You can, however, fit extra 32K CMOS static RAMs rated at 120nsec.

Along with standard features, the SuperPic software provides some excellent editing tools for grabbed monochrome images. The tools include expanding or contracting the contrast range, adding or subtracting a constant from pixel values, removing extreme high and low pixel values, switching values beyond a certain range to full black and white, reducing the number of bit planes used to store a picture, and re-distributing the pixel intensities to occupy the full range.


■ Yes we have no bananas...

A multi-capture option in SuperPic lets you take numerous grabs from a static image and produce one picture from the average of all grabbed frames. The reason for this is to remove noise.

Most irksome is the fact that the software often hangs for no reason – well there is a reason, and it's probably related to memory fragmentation. Like too much Amiga software it is possible to side step the problems. But it's really not good enough.

While nothing comes close to SuperPic's abilities, they should sack the author of the manual. Not only does it fail to teach complete novices to the digitising ballgame what the hell is going on, but it also forgets to mention some of the features found in the software. Gripe over. All things considered, SuperPic is unbeatable.



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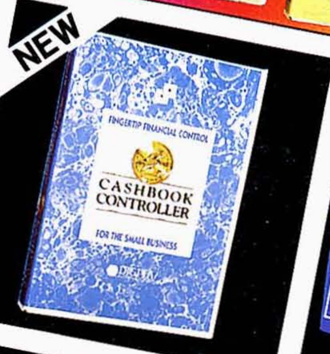




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VIDI AMIGA

Just a quick summary of Vidi's features – it was reviewed last issue. Undoubtedly the best value digitiser on the market. And quick too: frames are grabbed in a 50th of a second (real-time) and screen update occurs every quarter of a second. Because it is real-time, a variety of video sources inlcuding camera and recorder can be used.

All available memory is used in the Amiga for multiple framestores. A sequence of frames can be grabbed automatically and then animated. For instance, 22 frames are possible on a 1Mb machine.

Brightness and contrast can be altered as the picture is grabbed via controls on the interface. In addition, the brightness and vertical framing of the picture can be controlled from software.

A window can be defined on screen allowing the area within or without the window to be digitised.

The basic Vidi displays grabs using grey scales – and only in 320 by 200 16-colour mode. A PAL Vidi, with a resolution of 320 by 256, is available for £15 extra. Full colour images are possible for an additional £20. The technique for grabbing colour pictures is identical to Digi-View's method of doing things. ■

GLOSSARY

GENLOCK – a device that enables you to mix the output of an Amiga with the output of a video or TV source.
HALFBRITE – a fudged 64-colour mode whose extra 32 colours are half as bright as the first 32.
HAM – hold-and-modify. Another of the Amiga's fudged screen modes. This one can display 4096 colours on screen at once by giving the processor a hard time.
HAM+ – by using special software dithering effects it is possible to simulate a higher resolution and greater colour detail in HAM mode.
INTERLACE – this doubles the vertical resolution of a picture by displaying an image in two parts. A special high persistance monitor is necessary because the standard monitor flickers terribly when this mode is used.
NTSC – the standard TV and video system used in the US. It uses fewer horizontal lines than the European system.
OVERSCAN – a technique that removes the borders from an Amiga picture, and makes the image fill the monitor screen.
PAL – the European TV and video standard.



VIDI AMIGA
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CLEAN IT UP BABY

Some hints and tips on getting the best out of your digitiser.

CAMERA

If you have the choice, always go for a black and white camera for image grabbing. Black and white cameras tend to have a higher resolution than their colour counterparts. And they're a good deal cheaper. Of the four video digitisers reviewed, only Digi-View and Vidi can be successfully used with a black and white camera. Of course, the others can also be used with a black and white camera, but it seems a waste when they can grab colour pictures from a colour camera.

A good mono camera is the Panasonic WV140, or the slightly more expensive NWV1500. Prices vary from dealer to deale: typical cost £200 and £270 respectively.

LIGHTING

The more light the better, although too much can have adverse effects. The best for the job are usually fluorescent lamps as these simulte daylight convincingly. Spot lights are also useful. Three or four shining on the object to be grabbed will produce the best results. If too much light is used, however, you may get Moire patterns appearing in the grab. Conversely, too little light may result in grainy grabs. Always position the lighting to reduce the effects of glare or reflection on the object to be digitised.

MOTION

With Digi-View and Videon it is vital that the camera and object reamin still through the digitising process. Wavy lines or an out of focus look are sure signs that something has moved. If possible, make sure the camera is securely fastened to a tripod or copy stand. A good way to check that nothing is moving in the area between camera and subject is to fill a glass with water and watch carefully for ripples.

Vidi and SuperPic are real-time digitisers so it doesn't matter if the subject is moving. That said, if you need to take pictures of rapidly moving objects learn to track the object with the camera. The object will come out clearly while the background will distort.

COLOUR

Some cameras produce grainier pictures than others. Lowering the sharpness control will reduce the grain. This also removes the 'confetti' or haze from 4096-colour pictures. When using 32 colours or less, it is a good idea to raise the sharpness level as this increases dithering and smooths out colour bands that sometimes appear.

If you are digitising a picture into 32 colours or less, try to have a plain background behind the subject. A single-colour background will not detract from the main object, and it gives the illusion that more colours are available in the area of interest.




CLEANING UP

Digitising software often lacks facilities for tidying up pictures or modifying them in any way. As all digitisers produce IFF screen images, almost any art package will suffice. Look out for graphic packages that offer image stretching, shrinking, twisting and mapping. You won't always want to use pictures the shape or size you grabbed them in.

DigiPaint 3 (£69.95 from Precision on 01-330 7166) is a good choice when it comes to HAM painting. Features include 3D texture mapping, transparency control, lighten, darken, blur, text rendering, patterned or random dithering, and 68020 support. Other commendable art packages include *Deluxe Paint 3* (£79.95 from Electronic Arts on 0753 49442), *Photon Paint 2* (£89.95 from Digipro on 0703 703030) and *Spritz* (£29.95 from Best on 0698 887770).

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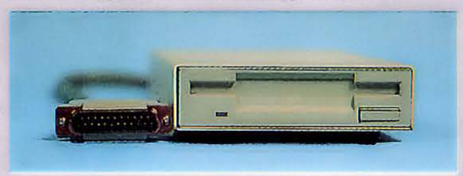
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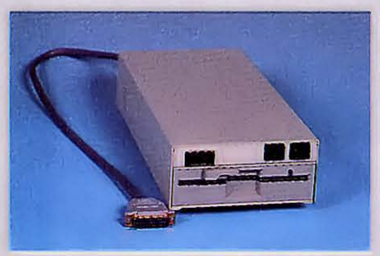
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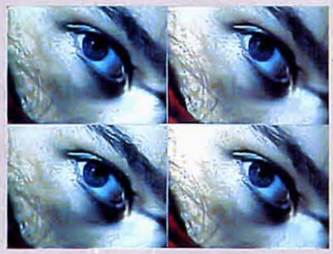
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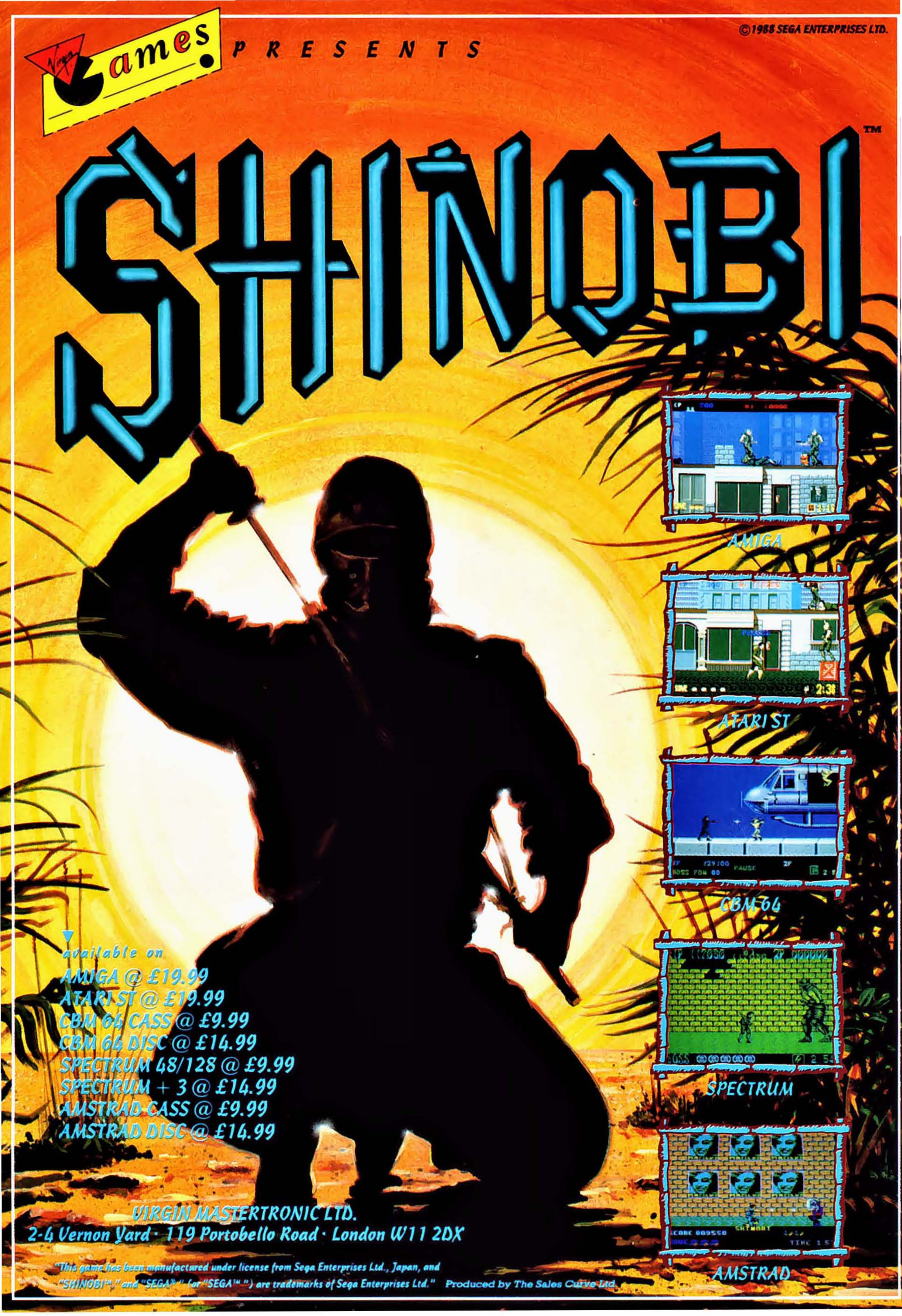
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Another month passes us by, and another *Format* Coverdisk wings its way to your Amiga, packed with the very best in Amiga software. **JASON HOLBORN** takes you through this month's silicon sizzlers.

DISK EXTRA

THE UNTOUCHABLES

PROGRAM: BY OCEAN SOFTWARE
FILES: UNTOUCHABLES, UNTOUCHABLES DEMO



■ **Somewhere near this loading bay of the warehouse, you may stumble on one of Capone's book-keepers.**

You are Elliot Ness, leader of the Untouchables, a small band of elite government agents brought together to fight organised crime and to end the gangland bosses' rein of terror. Head of the perps is Al Capone, the infamous gangland leader, who controls all organised crime on the streets of Chicago.

Your objective is to gain enough evidence against Capone to indict him on charges of tax evasion, thereby ending his grip over the Windy City.

The full game features six exciting screens based closely on the blockbuster film of the same name. Our demo finds Ness fighting his way through the warehouse occupied by Capone's thugs. You must burst in on them in an attempt to break up Capone's illegal boot-legged liquor operation in its tracks. As luck would have it, Capone's book-keepers are visiting the complex and so you take it upon yourself to grab their ledgers in order to gather preliminary evidence against Capone. However this isn't as easy as it sounds: these guys are packing heaters and most definitely dangerous!



■ **Sure enough, the dude with the brown coat has evidence.**

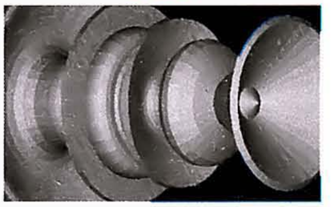
Evidence is collected by shooting Capone's book keepers (the chaps in the brown raincoats with the sawn-off shotguns!) who will then drop an item of evidence. Time is short, however, since you have only two-and-a-half minutes to collect all ten pieces of evidence. You'll be pleased to hear that in its final incarnation, the full game will allow you a full ten minutes to carry out this momentous task! ▶

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THE UNTOUCHABLES

It's tough on the streets! Al Capone and his motley mob have a stranglehold over Chicago and it's up to you to end their reign of terror in our exclusive playable demo of Ocean's latest. Plug a joystick into your machine and get going!

SURF



Producing realistic 3D graphics has always been bit of a complicated affair, but with *Surf*, all that is set to change. Explore the world of solid 3D modelling without ever having to leave the comfort of your armchair.

DEMOS CORNER

Anyone remember the classic 'Juggler' demo? This month's demo was produced for us by *Amiga Format* reader Ian Cacket using the same package that Eric Graham used to create his classic original. Load it up and remind yourself why the Amiga is such a wonderful machine.

GFXMEM

GfxMem is another handy little utility that deserves a place on everyone's Workbench disk. With it, you can see at an instant the state of your machine's memory without ever having to type a single CLI command.

ART



This month's pictures of pixel perfection were produced by Alastair Hearsum. Any of you think you could do better? If the answer is 'yes' then get them sent in and you too could see your works of art displayed on the screens of thousands of Amiga owners!

KEYCLICK

Who says public pressure doesn't have an effect? You lot have been screaming out for it, so here it is: a program to add a keyboard click to your Amiga.

WORKBENCH HACKS

This month, we have four of those binary beauties to keep you hack fanatics happy. This month's hacks are not only fun, but at least two of them have genuine practical uses.

ALWAYS MAKE A COPY OF YOUR DISK!

DISK NOT WORKING?
Then see page 78-79, fast!

Getting Going

You can load our exclusive demo of *The Untouchables* by inserting our Coverdisk at the 'Insert Workbench' prompt. To play, you'll need a joystick plugged into Control Port Two.

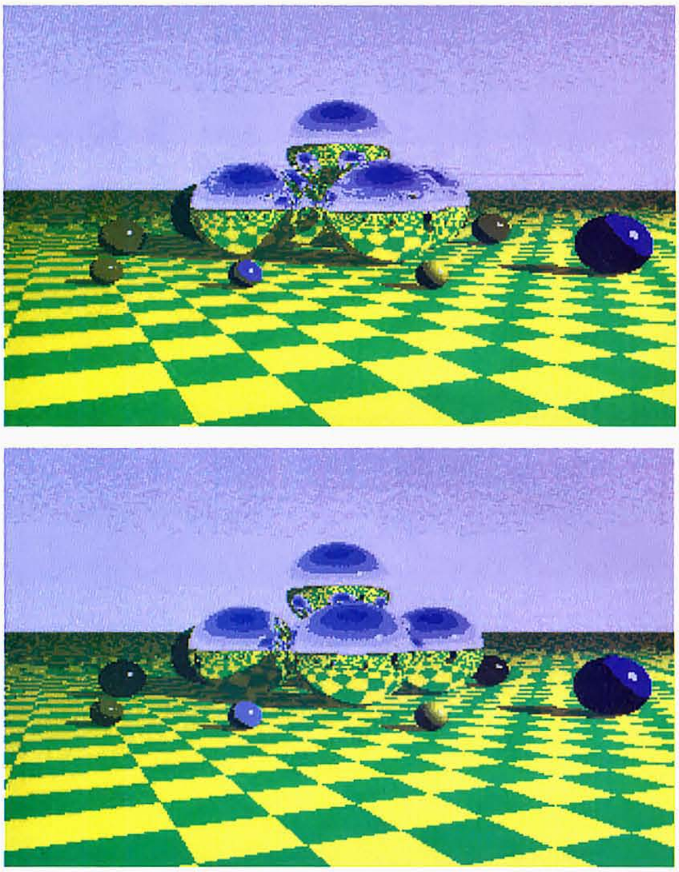
IMPORTANT!
512K OWNERS READ THIS!

Our demo uses every last byte available on a 512K Amiga and so you may have to switch off you machine, remove all external devices (such as disk drives etc) and then turn the machine back on with our Coverdisk in the internal drive. If you get an Error Code 103 when the game tries to boot, turn the machine off for a minute or so and then try again.

DEMOS CORNER

PROGRAM: BY IAN CACKETT
FILES: SPHERES, SPHERES.DOC

In the early days of the Amiga, the future looked rocky for the machine we have come to know and love. Although the machine boasted an impressive specification, a very modish look and a price to match, very little software existed to really show it off. Then along came Dr Eric Graham and his now famous *Juggler* demo. The *Juggler's* combination of 3D animation and HAM ray-tracing took the Amiga market by storm: nearly every Amiga computer stockist around the country had the *Juggler* up and running on their display machines. The sound of jaws dropping could be heard for miles!



■ ***Spheres*, this month's demo, made with the same utility as *Juggler*.**

What's that lot of irrelevent wibble got to do with this month's cover demo? I hear you ask. The answer is simple: *Spheres* was produced using the very same utility that Eric Graham wrote to create his original and it features the same high-quality ray-traced animation that made *Juggler* such an all-time Amiga classic.

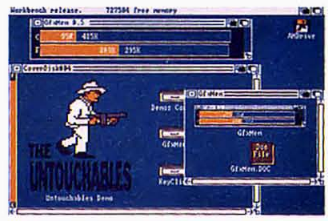
Getting Going

You can load this amazing demo by double-clicking on the *Spheres* icon from the Workbench. Once you've seen enough, you can quit back to the Workbench by clicking the left mouse button. Full instructions are available within the Demos Corner drawer.

GFXMEM

PROGRAM: PUBLIC DOMAIN
FILES: GFXMEM, GFXMEM.DOC

The Workbench memory counter is all very nice, but it can seem very uninformative at times. The system memory counter will provide you with an overall picture of available memory: but wouldn't it be nice to be able to see at an instant how much chip or fast memory has been used and is available?



■ **Memory availability visualised.**

Now you can, with *GfxMem. GfxMem,* as no doubt you ➧

ART

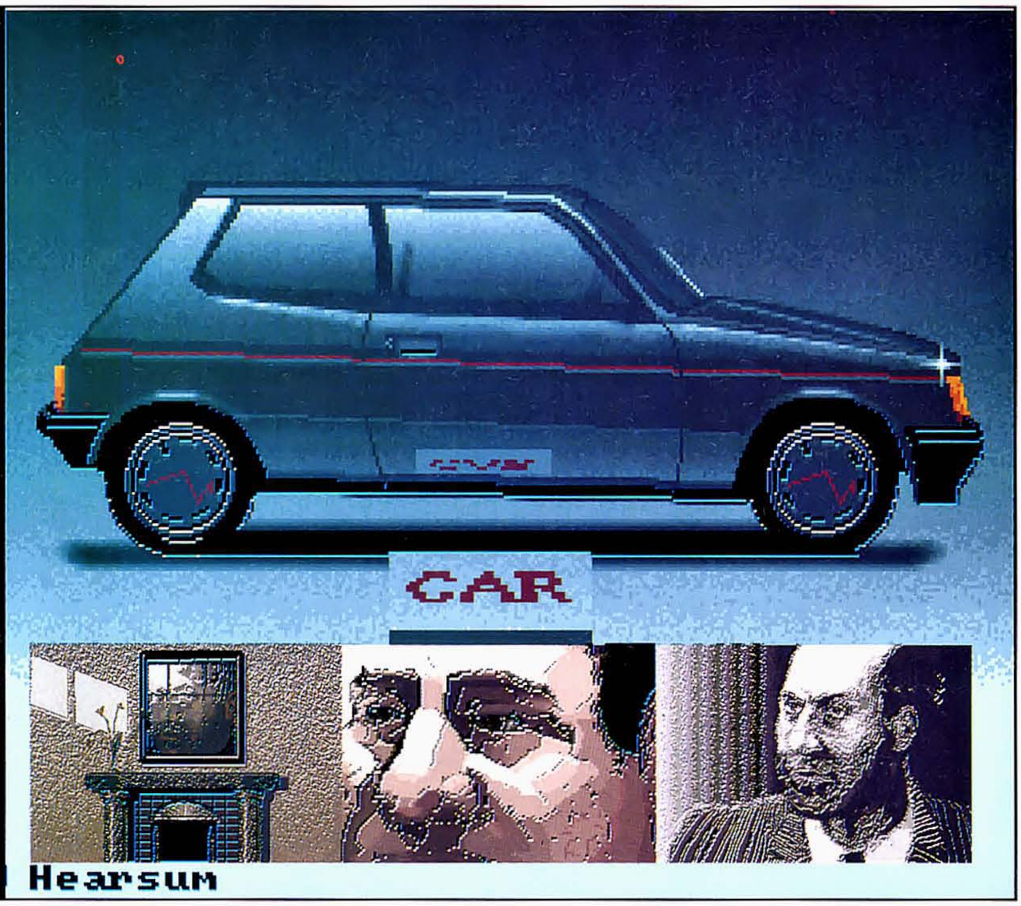
PROGRAM: BY ALASTAIR HEARSUM
FILES: FATMAN, REFLECTIONS, ART.DOC

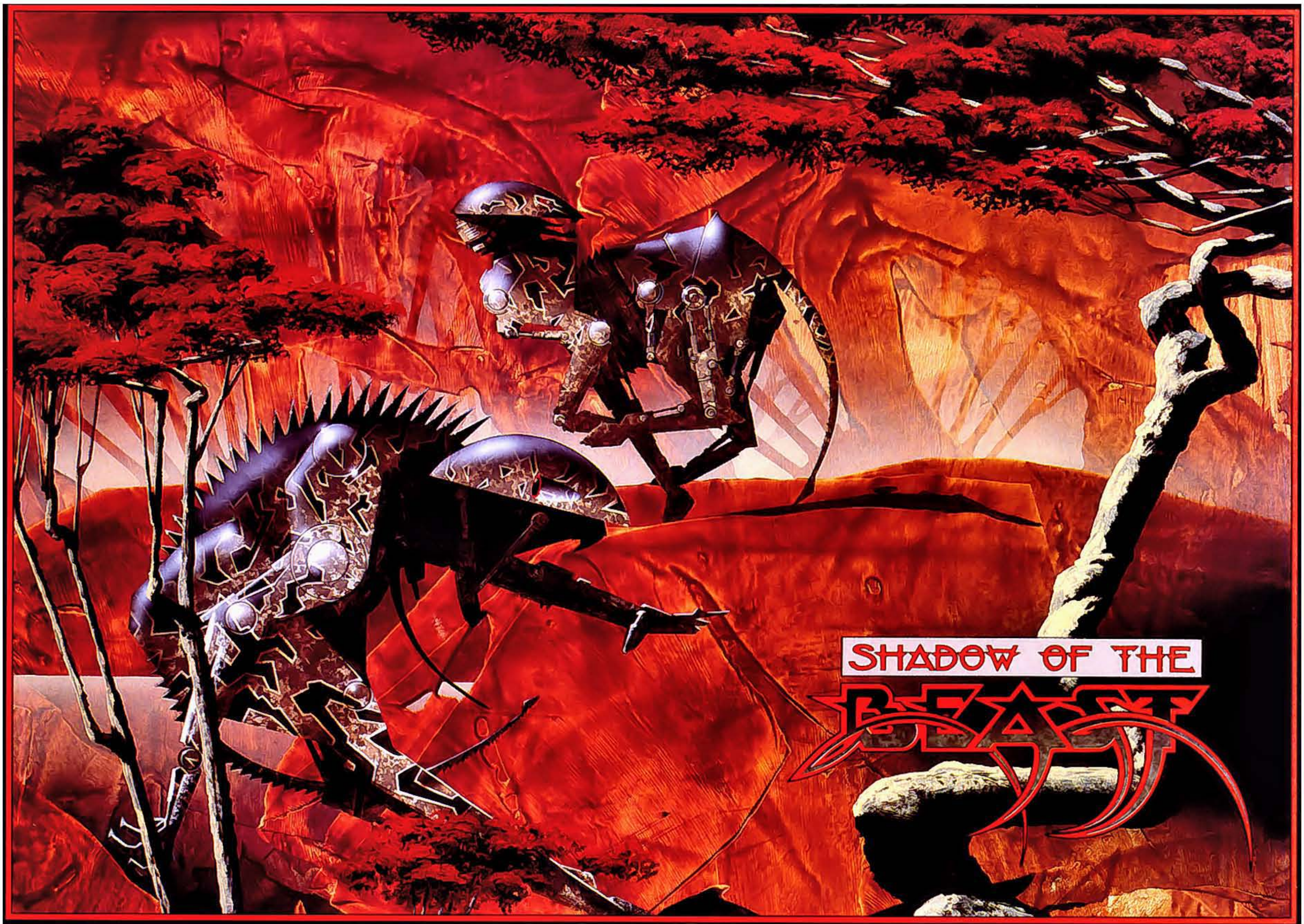
This month's collection of pixel art was produced for us by Alastair Hearsum, a name which may sound familiar. Some Amiga owners may remember a game called *Dick Special* that was being produced for Rainbird but unfortunately never appeared. Alastair created the graphics for that ill-fated project.

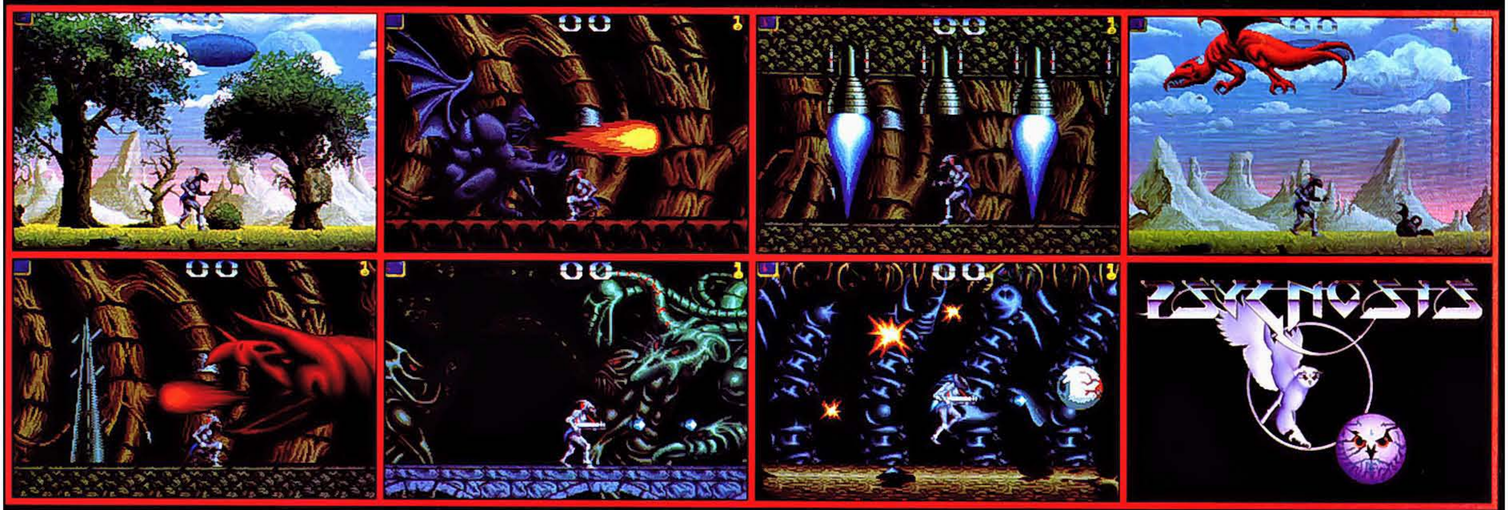
Think you can do better than Alastair? Then why not send your work in and every month our Graphics Editor, Brian Larkman, will be choosing a selection for publication on our Coverdisk. You too could be famous, up there with the graphic greats such as Andy Warhol, James Sachs and Frederich Bloggs (OK, I admit, I made up the last one!)

Getting Going

As well as the picture files, every Coverdisk has a small PD utility called *Vilbm* that allows you to view any picture that is in IFF format. To display a given picture, just double-click on its icon and *Vilbm* will automatically display it.







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have already guessed, graphically displays both memory usage and availability of all chip and fast RAM connected to the system. Whenever a program is loaded or removed from the system, *GfxMem* will automatically update the display to reflect the new memory state.

Getting Going

You can load *GfxMem* by double-clicking on the *GfxMem* icon on the Workbench. Full instructions are available within the *GfxMem* drawer.

KEYCLICK

PROGRAM: PUBLIC DOMAIN
FILES: KEYCLICK, KEYCLICK.DOC

You asked for it, so you've got it. *Keyclick*, as the name seems strangely to suggest, is a program to add a key click to your Amiga keyboard, just like that on machines like the Atari (don't blame us, you're the people who asked for this utility!)

What *Keyclick* does it to install a custom device handler into the Amiga operating system that intercepts all key depressions, regardless of what tasks are currently running. The program will only run under Exec, the Amiga operating system, and therefore *KeyClick* will not work with the vast majority of games software.

Getting Going

You can load *KeyClick* by double clicking on the *KeyClick* icon from Workbench. Once loaded, the program will display a small window containing two gadgets. The proportional gadget controls the click volume while the Boolean gadget turns the click either on or off. Full instructions, as always, are available within the *KeyClick* drawer.

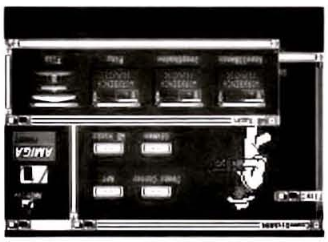
WORKBENCH HACKS

PROGRAM: PUBLIC DOMAIN
FILES: DROPSHADOW, SCROLLBENCH, PING, FLIP

Have we got a bumper collection of display hacks for you this month! We've got not two, not three but four of the little beauties for you to play with. For once, they aren't just fun, but two of them are genuinely useful!



■ *Scrollbench* having its wicked way with the Workbench screen.



■ No, we haven't printed this upside-down: that's *Flip* running.

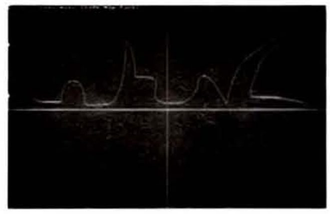
DropShadow - Aged *ST/Amiga Format* readers may remember this one from a past Coverdisk, but we thought it was so good that all our new readers deserved to benefit from its wondrous features (hype ends).

ScrollBench - Commodore's TV modulator doesn't provide the greatest of video displays and so some of you may find this little hack of some use to take undue strain off of the old eyes.

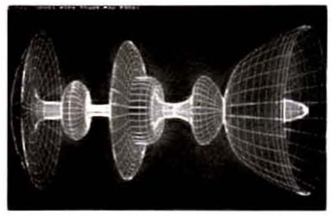
Ping & Flip - These two hacks are completely and utterly useless (and unashamedly so!) However, too much work and no play is definitely a bad thing (that's what my shrink tells me!) and so these little doses of stupidity won't do any harm.

BEZSURF

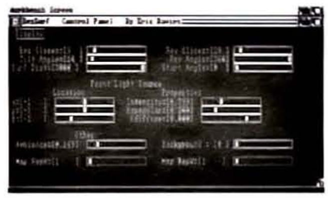
PROGRAM: PUBLIC DOMAIN
FILES: BEZSURF, BEZSURF.DOC



■ Just a quick squiggle is all that is needed to produce some quite remarkable results.



■ Our squiggle as a 3D wireframe.



■ The *Surf* control panel allows you to rotate the object in three dimensions, and achieve many more effects besides.

Producing 3D solid objects on Amiga is pretty tame stuff these days, but up until now the process has been painfully complicated. For example, if you wanted to produce a plain old cube, you'd be sat fiddling around with unfriendly object editors for hours before something even remotely cubish finally appeared on screen. Wouldn't it be nice if you could produce really complicated 3D objects without having to study advanced maths and engineering? Enter *BezSurf*, a easiest 3D solid object modelling package in existance.

BezSurf is a program for producing bezier surfaces of revolu-

USING THE DISK

Backing Up Your Disk

For a number of reasons, it is rather important to make a backup copy of the Coverdisk as soon as possible. Copying the disk may sound like a complicated task suitable for technobuffs only, but it is surprisingly simple provided you read the following instructions carefully:

1. First, turn on your machine and load Workbench. Once the Workbench screen appears and the disk-drive light goes out, remove your Workbench disk and insert our cover disk.

2. Next, click once on the Coverdisk icon and then press the right mouse-button and the Workbench menus will appear. Now, while keeping the right mouse-button depressed (you can cheer it up afterwards!), move the mouse pointer over to the 'Workbench' heading and a menu will drop down. Move the mouse pointer over the 'duplicate' menu option and then press the left mouse-button.

3. After a few seconds' disk access, the Workbench DiskCopy tool will be loaded and run. Now just follow the on-screen prompts and your *Amiga Format* Coverdisk will be copied to a backup disk. When the machine asks for the destination, insert your blank disk into the drive. Further instructions can be found in the user's guide that comes with your Amiga.

Using the Programs

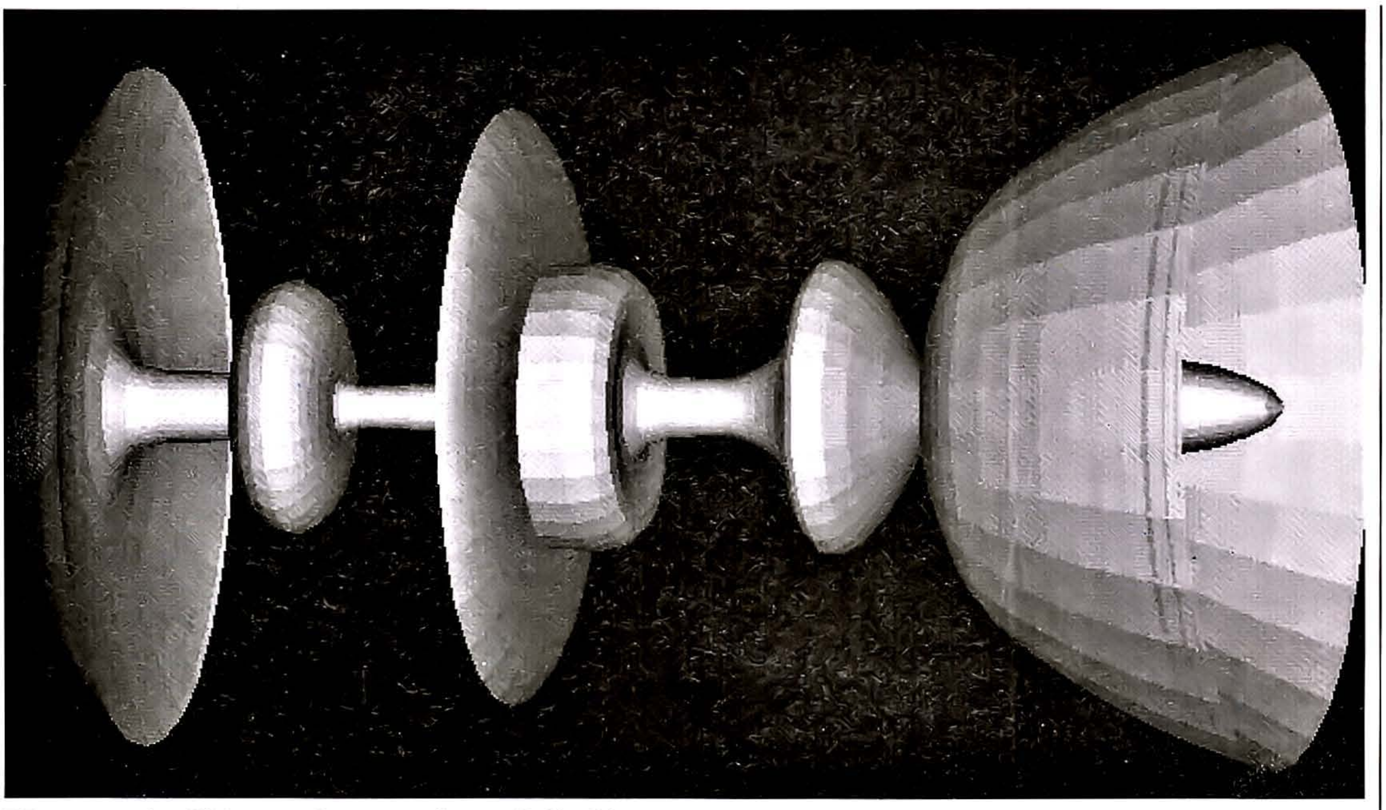
All the programs on the *Amiga Format* disk are specially set up to make them as easy to use as possible. If you can use the Amiga's Workbench then you can use our Coverdisk! If you do have problems with a program, full instructions on loading and using the programs are included in the Disk Pages and these should get you up and running. If you still have problems, you should read the documentation file (.DOC) that is included with every program. To run any of the programs on this month's Coverdisk, all you have to do is follow a very simple procedure. Unless specified differently within the Disk Pages, just double-click on the program's icon on the Workbench and the program will load and run. Full details on how to use the programs once they have run are included with the Disk Pages and also as a documentation (text) file accompanying the program.

To display a documentation file, just double-click on the appropriate .DOC file to be viewed and a window will open containing the file's contents. Pressing the space bar will advance a page at a time.

Before using your *Amiga Format* disk, you should make a back-up of the master disk as soon as possible. This is very important!

Is Your Disk Faulty?

We have done our best to check that the programs on the *Amiga Format* Coverdisk are simple to use, error-free and have no known viruses. However, we cannot normally answer telephone queries on using the software, and we do not accept liabil-



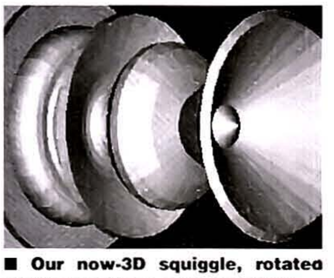
■ Even a complete idiot can produce astounding results like this.

tion: that's what the documentation says, anyway! With just a minimal amount of effort, some quite astounding results can be produced. As well as producing plain 3D objects, *BezSurf* can also map any IFF picture file onto an object. Very impressive!

To produce an object, all you have to do is to draw a series of connected lines, then just select either 'Wire', 'Shade' or 'Map' to see your lines tranformed into a solid object. Optionally, any of the points that make up the backbone of your object can be pulled out to produce bezier curves, therefore producing more subtle curves in the final object.

Getting Going

You can load *Surf* by double-clicking on the *Surf* icon from Workbench. The first time you select either 'Wire' or 'Shade', the display may switch back to the Workbench screen and a requester will ask for Workbench to be inserted. Insert the Workbench disk you booted from and then press <Left Amiga> <N> to switch back to the *Surf* screen. Full instructions are available within the *Surf* drawer. ■



■ Our now-3D squiggle, rotateo and viewed from a new position

ity for any consequences of using the programs on the disk.

If your *Amiga Format* disk is faulty – and out of the tens of thousands duplicated, some are unfortunately bound to be – you should send it back for a free replacement within a month of the cover date to: Amiga Format November Disk, Discopy Labs, Unit A, West March, London Road, Daventry, Northants, NN11 4SA.

If your Amiga refuses to accept the disk, try using the DISKDOCTOR utility on your Commodore Workbench disk to rescue it before sending it off for a replacement. Full details of DiskDoctor can be found in the user's manual that came with your machine.

Copying the Disk

Unless specifically stated, the programs on the Coverdisk are not in the public domain and the copyright remains with the author. Selling or distributing these programs without the author's permission is against the laws of copyright.

EARN YOURSELF £800

Name ....

....

Address ....

....

....

Telephone (Daytime)..

(Evenings)..

My program name is..

....

Approximate total size of files in kilobytes ....K **(we cannot use programs longer than 200K; shorter submissions, under 100K, stand the best chance of publication). It is a:**

☐ **Game** ☐ **Technical tool**
☐ **Business utility** ☐ **Art program**
☐ **Music program** ☐ **Educational**
☐ **Novelty** ☐ **Other**

BRIEF DESCRIPTION ....

....

....

....

CHECKLIST (please tick):

☐ **Stamped, addressed envelope for return**
☐ **README.DOC explanation file on disk**
☐ **Printout of README.DOC file (if possible)**
☐ **Name, address, machine type written on label**
☐ **Disk certified virus free**

IMPORTANT **Please sign this declaration:**
This program is submitted for publication by *Amiga Format*. It is wholly my own work and I agree to indemnify Future Publishing against any possible legal action should copyright problems arise.

Signed ....

Date ....

If you've got any programs for the Amiga which you think other readers would find useful, interesting or amusing, we'd like to know about them.
1. Make sure your program is foolproof to use. 2. Create a file called README.DOC on the disk which explains exactly how to use your program.
3. Fill in this form, sign it, and send it without delay to:
CoverDisk Software, Amiga Format, 4 Queen Street, BATH BA1 1EJ
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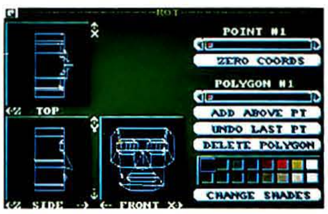
PD UPDATE

The Amiga certainly isn't short of its fair share of quality PD software. For the price of a disk, you could fill your collection with some of the finest PD programs available. Are you getting yours? JASON HOLBORN certainly is!

ROT
Fish Disk 71

Hands up who has been playing with the *Surf* program on this month's Coverdisk? Fun, isn't it! Although creating three-dimensional images is one thing, with *Rot* your 3D objects can enter the fourth dimension.

Rot is a program designed to generate, display and animate solid 3D objects. It is made up of two separate sections: an object editor and an action editor. The first is used to create your 3D objects using a system similar to that of commercial 3D modelling programs such as Byte-By-Byte's *Sculpt* series. The action editor allows you to breathe life into your creations by changing aspects of the object within a series of frames, therefore creating animation. You can change aspects such as the object's position or orientation to create animation effects such as the usual tumbling and spinning.



■ **The *Rot* object editor looks and feels similar to that of professional programs such as Byte-By-Byte's *Sculpt 3D*.**



■ **Once you've created your object, it's time to bring it to life with the *Rot* action editor.**

Rot is quite a complex program and will undoubtedly take many hours to master, but the end results are very impressive. If you're willing to sit down and give *Rot* a chance to prove itself, then you'll have a great deal of fun with this excellent utility. If you're considering playing around with 3D animation, then *Rot* is an ideal introduction to this most fascinating area of computer creativity.

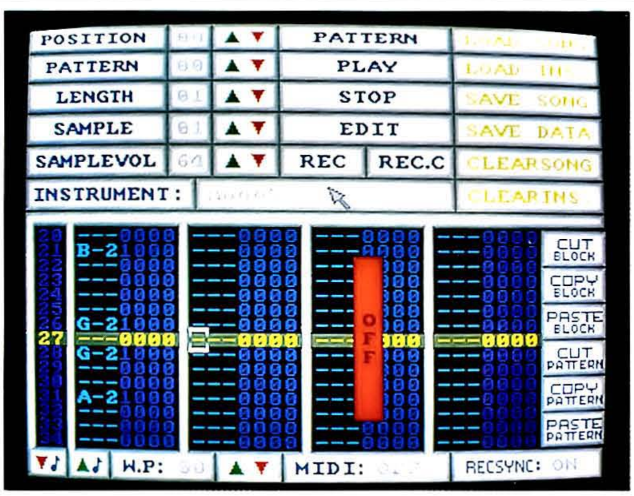
GAME MUSIC CREATOR
17Bit Disk 482

Writing music scores for computer games has always been a bit of a problem unless you're blessed with musical talent, or have access to a decent freelance musician. Even if you have the know-how, how are you going to get the music in your head into a form for use within your own programs? Simple: you need a program like the *Game Music Creator* from Seventeen Bit Software.

The *Game Music Creator* is a powerful music composition tool designed specifically with the assembler programmer in mind. The program employs the same system of composition as that employed by the infamous *Sound Tracker*, used by numerous games programmers and demo coders. Anyone who has used either a drum machine or *Sound Tracker* will feel instantly at home with the program. If you haven't used either of the above, *GMC* uses a pattern-based system of splitting up the score into distinct sections (known as patterns). Each of these sections contain four channels' worth of music data which can play up to four sampled instruments simultaneously from a choice of sixteen.

Nothing special so far, I hear you say. Well, unlike *Sound Tracker* and similar programs (where's *SoundFX* when I need it!), *GMC* is MIDI compatible. The benefit of this will be immediately obvious to those of you who own MIDI equipment: because this basically turns *GMC* into a simple real time sequencer. Instead of having to manually key in each note, you can choose real-time recording and then play whatever iti is you wish to be recorded, on your MIDI-compatible keyboard.

GMC is very much built upon the complaints that surrounded the original *Sound Tracker*. For starters, the instruments that could be used by *Sound Tracker* had to be declared using a separate 'Preset List' editor that ▶



■ **Creating music of a reasonable standard for your programs has never been so easy as it is now with the *Games Music Creator*.**

produced a list of available instruments and was automatically pulled into *Sound Tracker* when the program first loaded. Thankfully, this has been fixed and now any sampled sound, regardless of format, can be loaded in at any time, from any disk.

Once you've created your masterpiece, you'll want to use it within your own programs. Well, the programmers of *GMC* have thought of this also, so they've included all the necessary source code to allow you to play your *GMC* tunes from within your assembler programs. The *GMC* play routine runs under interrupt and therefore your program can continue running while the music plays in the background.

For games programmers and demo writers, the *Games Music Creator* is an absolute must. The inclusion of assembler source code takes the burden of music creation away from the programmer, therefore allowing him to concentrate on the more important subject of games design and implementation.



■ ***Games Music Creator*: an absolute must for games writing.**

RECORD-REPLAY

Fish Disk 95

As the owner of a machine as powerful as an Amiga, you have no doubt had to sit through the endless process of demonstrating its wondrous capabilities to everyone from your best friend to Granny Gertie. While it can be quite enjoyable watching their jaws strike the ground every time you load your latest demo disks, it soon becomes tedious when you have to demonstrate a piece of serious software such as *Deluxe Paint* over and over again. Wouldn't it be nice if the Amiga could handle the demonstration itself while you sat back and read the latest issue of *Amiga Format?*

Record-Replay, as you may already have guessed, is a pair of neat little programs that will allow you to do just that. To use them, what you do first is to run the *Record* program, and then perform the operations you wish to demonstrate. *Record* then monitors what you are doing and stores all mouse and keyboard operations in a separate file. All you now do is to feed the output file from *Record* into a separate program called *Replay,* which then repeats your actions right down to the slightest mouse click.

It can be quite an strange experience to watch your Amiga working without your participation. As well as the obvious fun aspect of this set of programs, something like *Record-Replay* would make software houses' lives a good deal simpler, since it could be used to produce truly interactive tutorials for serious programs such as word processors and databases. Are any software houses listening?

TOP TEN PD

GTS Title

1. **FISH 215**
2. **MEGA GAMES PACK II**
3. **TBAG 26**
4. **STAR TREK**
5. **TBAG 29**
6. **HOME BUSINESS PACK**
7. **TBAG 16**
8. **TBAG 31**
9. **FISH 196**
10. **DESIGN FACTORY**

DEMOS CORNER

This month's selection from the very best of PD Demos concentrates on a number of quite, quite remarkable animations. Over to JASON.

COOL COUGAR

17Bit Disk 485

Weird, but cute! That's all you can say about this latest demo. The full name of the demo is *The Education of Cool Cougar* and it was produced using the *Director* utility from American software house The Right Answers Group.

The demo is a short animated story based around two lovable (?) cartoon characters called Buckey Rabbit (oh, the little bunny wabbits!) and the star of the show, none other than Cool Cougar (who?) Now, as the rules of nature dictate, Cool Cougar wants to invite little Buckey (isn't this cute!) to dinner, with the young rabbit as the main course. As the story unfolds on your screen, you'll be able to see how young Buckey thwarts Cool Cougar's evil plans.

The Education of Cool Cougar just oozes cuteness and is a worthy addition to any demo collector's disk box. Get it, and it's a good bet you won't regret it!

INTROS 14

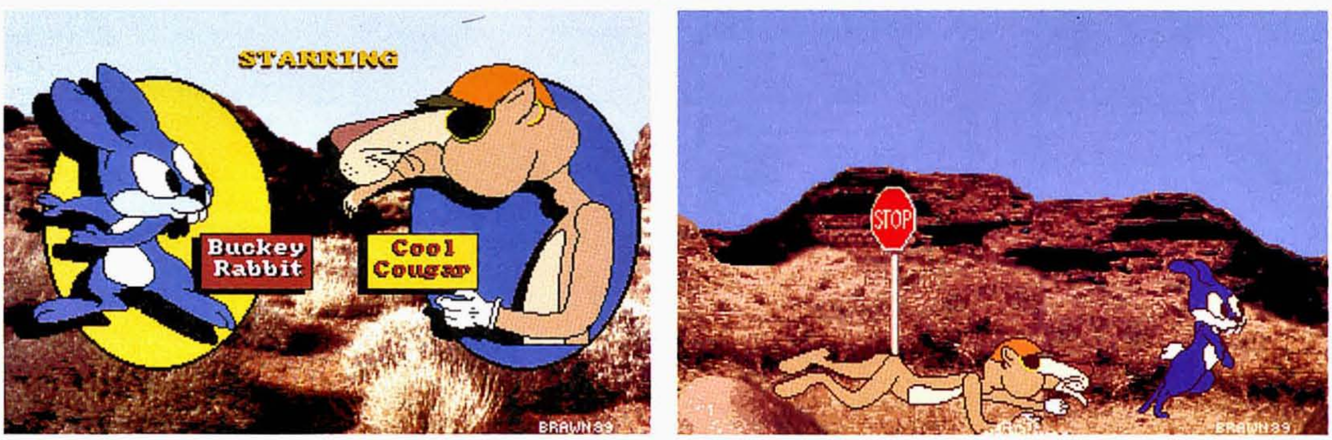
17Bit Disk 280

Demo disks usually come in one of two categories. The category that includes the rest of the demos in this month's PD Update is a single disk, containing just one major demo that usually fills the entire disk. The second category, which Intros 14 falls neatly into, is a disk containing a selection of small demos, or 'Intros' as the programmers prefer to call them. Intros Disk 14 contains six different intros, as follows:

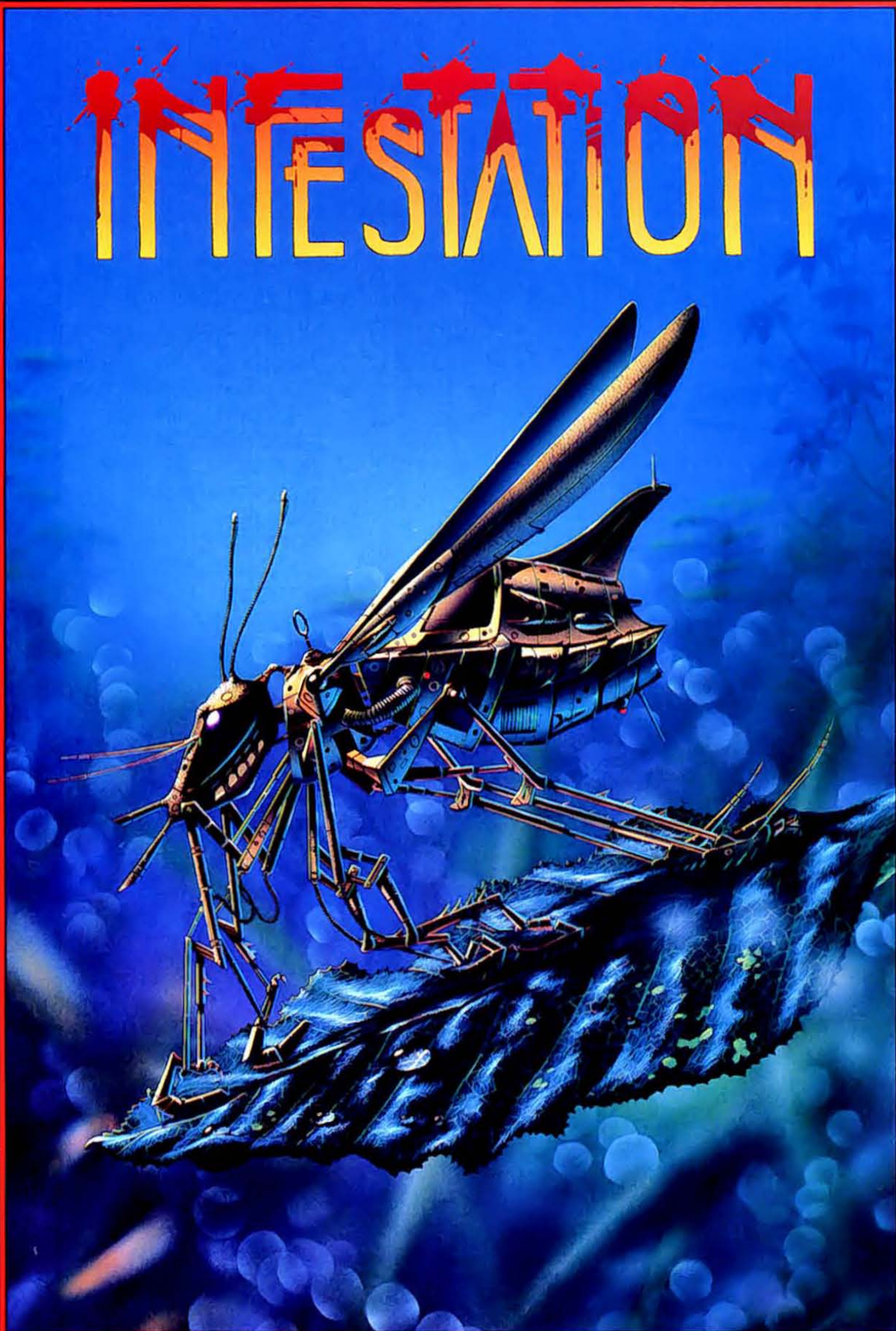
CASCADE: Run of the mill copper and blitter extravaganza with scrolling text and a pretty average *Sound Tracker* tune to accompany the whole shebang. Includes plenty of cliched copper tricks for you to spot, such as parallax starfields and multi-coloured bars.

MIRAGE: Another copper/blitter overkill with some very nice music.

ROGER RABBIT: Definitely one of the best on the disk. Based



■ **The stars of this animation are Cool Cougar and Buckey Rabbit, who indulge in a spot of Road Runner and Wile E Coyote-like chasing.**











INFESTATION

Are you ready for a new level of realism in computer games? Are you prepared for an atmospheric experience you will never forget? Can you cope with super-fast solid 3D vector graphics? Will you venture into the unknown, alone, and armed only with a single pulse rifle? Can you overcome the INFESTATION?

INFESTATION takes computer games to a new level of realism. It creates a complete environment stunningly rendered in super-fast solid 3D vector graphics. You are completely free to move within the game world, examining and manipulating objects just as you would in a real world. And, as in reality, you are not alone. Only, unlike those on Earth, the other occupants of Infestation's world are not very friendly at all . . .

Your task as Kal Solar, Agent of the Interplanetary Federation, is to travel to Alpha II, investigate and end the alien threat. Your mission will not be an easy one. As well as the mother alien and its eggs, you will have to deal with hostile droids and computer systems, radioactive areas, and things unknown.

INFESTATION is a truly atmospheric experience. Don't play this game when you're alone . . . it may well be your last!

Screen Shots from the Atari ST version AMIGA/ATARI ST £24.95

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▸ around last year's hit film 'Who Framed Roger Rabbit?' and including an excellent sound track complete with samples from the film. Listen hard and you can hear Roger saying things like 'We're running out of time!'. Very nice.

IT: Another very weird demo that shows four animated cartoon characters who perform certain actions (such as pulling faces and throwing up) in time to the music. Its weirdness makes it worth acquiring.

PAN: Surely no one can fail to have heard of the famous *PAN* series of demos? We recently looked at the follow-up to this demo, *PAN II*, but *PAN I* can still hold its head up high as one of the best Intros on the Amiga. Although visually there's not a great deal to get excited about, *PAN* includes some frighteningly atmospheric pan-pipe music.

GHOST POOL

17Bit Disk 463

Like the *Ship+Sphere* animation, *Ghost Pool* was produced using Byte-By-Byte's popular *Sculpt-Animate 3D*. This rather unusual demo is an animation of an unseen but obviously hip spirit taking time out to have a quick game of pool. Also on the disk is a second *Sculpt-Animate* animation of water dripping into a plant pot which, although this may sound about as tedious as playing *Classic Invaders*, is still quite impressive.



■ This pool cue is not simply flying around of its own accord: it's being wielded by a particularly hip spirit in the *Ghost Pool* anim.

SHIP+SPHERE ANIMATION

17Bit Disk 464

(1 Meg Only)

It's been a long time since some quality ray-traced animations have appeared within the Public Domain. Following in the foot steps of the daddy of them all, the *Juggler*, comes the *Ship+Sphere* animation, which is sure to make just as much impact on Amiga owners as the Eric Graham original. The animation was produced using Byte-by-Byte's *Sculpt-Animate 3D* package, which combines the power of ray tracing with animation to allow the creation of some spectacular results. The demo portrays a small space craft orbiting a glass sphere that in turn contains another glass sphere. As you would expect from a ray-traced animation, the most impressive aspect of the demo is not the actual mechanics, but the life-like realism of the whole affair. ■

TOP TEN DEMOS

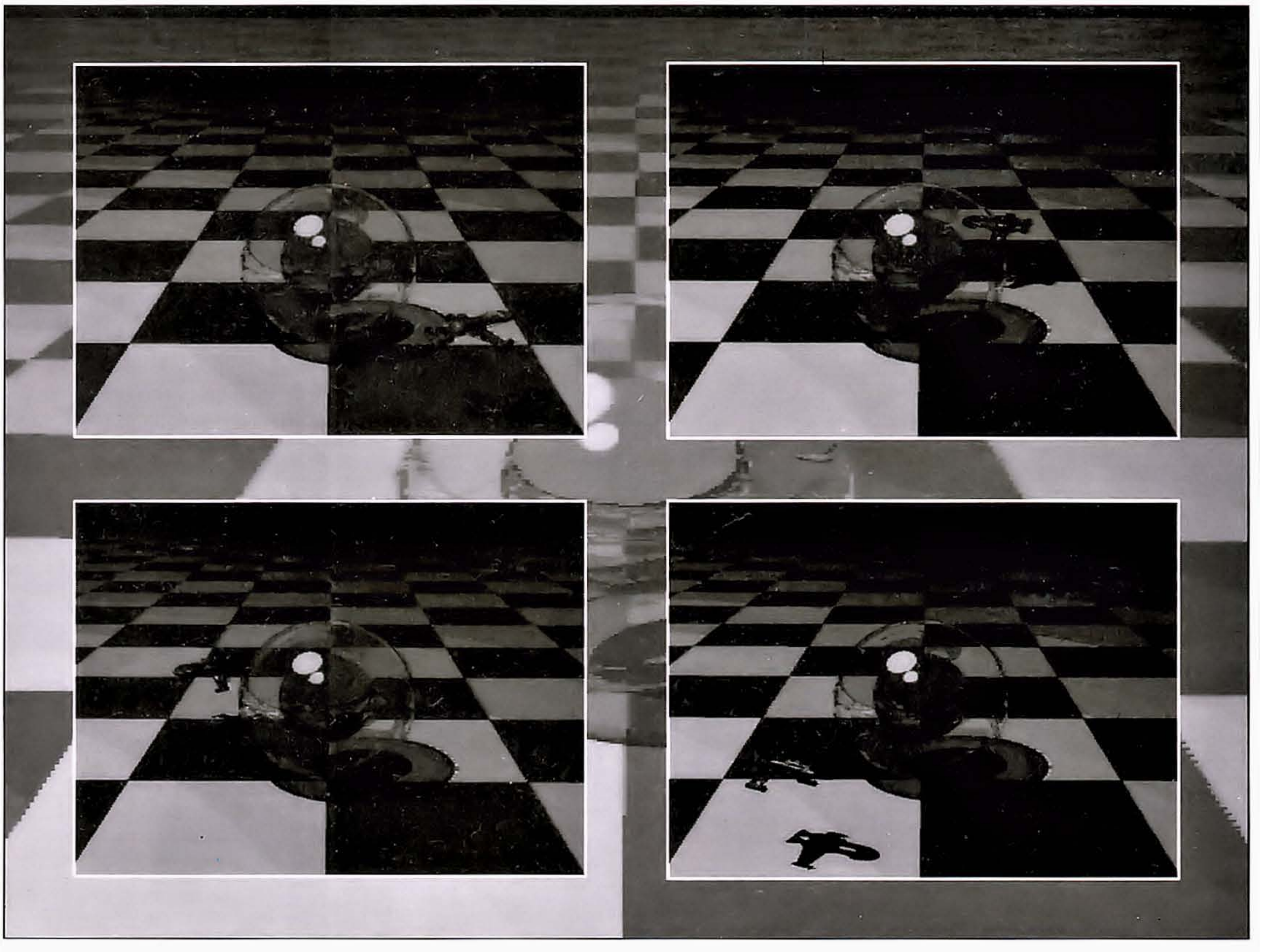
17Bit Disk Nos throughout

1. **(412) TITANICS ACID HOUSE**
2. **(426) KAKTUS/MAHONEY**
3. **(353) GHOSTWRITER DEMO CREATOR**
4. **(404) SUPREME SOUNDS 1**
5. **(401) INTROS 19**
6. **(329) STAR TREK DRY DOCK ANIM** (1 Meg)
7. **(482) GAME MUSIC CREATOR**
8. **(436) SUPREME SOUNDS**
9. **(148) THE KNIGHT ANIM** (1 Meg)
10. **(255) WALKER DEMO 2** (1 Meg)

SUPPLIERS

The following companies are responsible for the distribution of Amiga Public Domain software in this country. For their full address, check the advertisements in this issue of *Amiga Format*, or give them a ring.

George Thomson: 077082 234, **17 Bit Software:** 0924 366982, **Softville PD:** 0705 266509, **Amiga PD Library:** 0742 588429, **Purple PD:** 0279 757692, **Ray Burt Frost:** 0703 785680, **BlitSoft PD:** 0908 663528, **Senlac PD:** 0424 753070, **Deeper Domain** 01 204 3954



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● **Mega Pack 5** Picture Pack 1, packed full of the best Amiga pictures.
● **Mega Pack 6** Demo Pack 1, Thames TV demo, The Juggler, loads of bouncing Boing demos, Jungle Command.
● **Mega Pack 7** Amiga Basic Pack 1, games, utilites, demos, loads of excellent programs.
● **Mega Pack 8** Game Pack 1, Empire, Gravity Wars, Othello, Pacman, Clue, Cribbage, Back Gammon, Yahtzee, Missile Command, 3D Break out and many more.
● **Mega Pack 9** Picture Pack 2, packed full of the best Amiga including some NASA digitised pictures.
● **Mega Pack 10:** Demo Pack 2, excellent graphics & sounds. New Order Blue Monday digitised sound demo, Ian 'n' Mick and the DOC demo.

*** * Mega Packs 11 to 20 each consist of 5 disks * * for £12.50! fully inclusive!**

● **Mega Pack 11** Sonix Music Pack. Includes the PD player for Aegis Sonix music program and 4 disks full of music scores.
● **Mega Pack 12** Miami Vice sampled sound demo of the Miami Vice theme. Excellent graphics and sound.
● **Mega Pack 13:** Demo Pack 3, Einstein, Bruce & Bongos, Anti Trax 2010, Digi Tech and Share & Enjoy demo disks.
● **Mega Pack 14:** Demo Pack 4, Sanx, Sanxim, Mark II, Action! and TECHtech demo disks.
● **Mega Pack 15** Demo Pack 5, Needs two disk drives, New Tek, Pophits sampled sounds of Pet Shop Boys, Madonna and other pop groups, disk of sampled sounds including Star Wars, Mr Spock etc and Beatles music over great graphics Killer Demo.
● **Mega Pack 16** ABasic Pack, Games, Utilities, demos etc includes ABasic. Note ABAsic is not Amiga Basic.
● **Mega Pack 17:** Utility Pack 1, Printer Driver Generator, Fonts and Font Editor,Floppy disk utilities, disk copiers, clocks, calendar, directory lister, Virus Checker and other utility programs.
● **Mega Pack 18** PD Experience!, a mixed bag of public domain utilties, graphics, demos etc. all disks from the Tampa Bay Amiga Group all auto loading and very easy to use! Simply place disk in your Amiga and turn on! Excellent
● **Mega Pack 19** Utility Pack 2, Icon utilities, Mouse pointers, printer drivers and fonts, SCReen IMage to PrintER, PopCLI and loads of brilliant utilities.
● **Mega Pack 20:** Picture Pack 3, Needs two disk drives, 5 disks of brilliant HAM and low resolution pictures. All auto loading.

APPLICATION DISKS

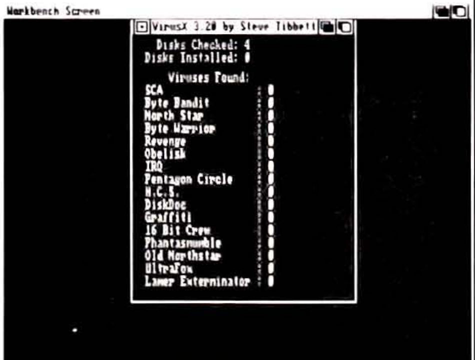


FFISH 189 Uedit v2.4g The Word Processor

● **FFISH 189** UEdit V2.4g the excellent word processor.
● **FFISH 176** AnalytiCalc V23.2a of the large and powerful spreadsheet. Requires 1Mb RAM and 2 drives.
● **FFISH 143** RIM V5.0 is a Relational Information Manager, a fully relational DBMS that is suitable for very large databases using B Tree data storage. Versions of RIM run on a variety of micro systems both small and large, and produce compatible databases. Includes a built in HELP database and a programming language.

UTILITY DISKS

● **FFISH 213** Bitplanes the 8 colour icon user and 300 8 colour program icons!
● **FFISH 188** Boot Intro V1.0 displays a scrolling and a still message of your choice at boot up. DiffDir V1.0 compares 2 directories. FracGen V1.23 fractal generator a real fully featured fractal program.
● **FFISH 168 and FFISH 169** The Matt Dillion disk special includes loads of utilities and source. Config V1.0, Clock V1.0, DME V1.31, DMouse V1.1, Backup V2.01, SUPLIB, LIBREF, DRES V1.0, DASM V2.11 FILES V1.2, SHELL V2.1, FINDIT V1.0, LIBS V1.0, SCAT V1.0, ADDCR V1.0, REMCR V1.0 and CMP V1.0.
You will need both disks @ £3.00 each.
● **FAUG 41** Rain Bench, Amiga Arc V0.2 compatible with ARC V5.0.
● **Virus X V3.2** The virus killer that sits in memory and checks disks as they are entered.



Virus X V 3.2

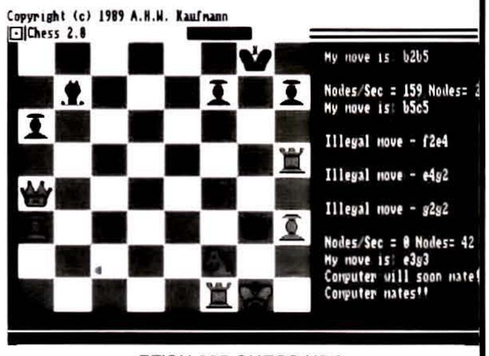
● **AMICUS 22** Printer Driver Generator V2.3, Show Print II 3 IFF screen dump.
● **FFISH 158** DiskX is a sector based disk editor, MemBoardTest V2.4, MSDOS V0.1 lists files written in standard MSDOS or ST format, then copies them to RAM then rewrites to disk in AmigaDOS format, PCBTool V2.6 is an early version of PC Board layout program that does not support printers, ScreenX is a small clock/memory counter, TaskX V2.0 is a 'realtime' task editor.
● **FFISH 157** XIcon V2.01 allows you to call up scripts containing CLI commands from an icon.60 or80 toggles 60/80 column text, BootBack is a disk boot block save/rewrite and copy program, ECPM is a CP/M emulator.
● **FFISH 145** Dmouse V1.06 is a versatile program that includes screen/mouse blanker, auto window activator, mouse accelerator popcli, pop window to front, push to back etc.
● **FFISH 131** DFC is a disk copier that multi-tasks, Hyperbase V1.6 is a database management system, Mackie is a PopCLI replacement, Micro Emacs VMg1b the text editor.
● **FFISH 130** DirMaster V1.1 is a disk cataloguer, Hp V1.0 a nice RPN calculator which supports calculations with binary, decimal, hex float & complex numbers. Mach V1.6a the mouse accelerator.
● **FFISH 129** DosKwik a pair of progs which allow you to save files or groups of files to one or more disks for quick loading, MRBackup V2.0 and V2.1 a hard disk back up utility.
● **FFISH 69** Spool V1.2 a queue manage, printer driver and SPOOL requester and Wc a file word counter. Asm68K V1.0.3 fully featured macro Assembler, Blitlab a blitter exploring program in C. Conman V0.9 a sort of CLI shell, Dk decays the screen bit by bit, Frags displays memory fragmentation by listing the size of free memory blocks, Icontype changes the icon type, MonProc monitors processes for packet activity, MouseClock turns mouse pointer into a digital clock, Spew generates News of The World type headlines, Sb a sytem browser.
● **FFISH 65** Sunmouse V1.0 automatically clicks in windows when the mouse is moved over them, RunBack starts programs from CLI allowing CLI window to close.
● **FFISH 55** ASDG-rrd a RAM disk that survives reset, BigView displays any size IFF picture, EGraph creates graphs from X,Y pair text files. Hyperbase V1.5 a neat database management system, MemClear Zero fills free memory, NewZap V3.0 disk sector editor, Rainbow makes Workbench background a rainbow, 2 Smusplayers to play SMUS IFF music files. View a tiny IFF picture viewer, WB to JX 80 screen dump.
● **FAUG 67** Disk X V2.0 the sector editor, Hand Shake V1.06b a VT100 terminal emulator, Pack It a whole disk compressor.
● **FAUG 62** Access! V2.6 very powerful telecommunications package. Hide It allows you to turn off and on your RAM expansion. Cron runs a table of background tasks, Add Icon V1.0 adds icons to files without icons, IFF Mirrors is an ILBM slide show with X and Y mirroring, FFormat V1 a fast formattor.
● **FAUG 50** Dir Util V VI the disk manager, Roll Back V1.0 rolls back text that has rolled off the top of the screen, Short Cut allows you to define text to a single key stroke, thus CLI commands are simpler to type.
● **FAUG 47** FunKey assign any text string to a function key.
● **FAUG 37** Star Chart V1.0 600 stars, galaxies etc. AM Cat the disk cataloguer,Macpaint picture viewer V1.2.
● **PAN 25A** Disk Wipe very quick disk contents wiper, SELECT allows you to select in your Startup Sequence from a number of scripts, Virus Check V1.1.
● **PAN 19D** ZOO V1.42a a very good file compressor, Con Man V0.99b provides line editing and command line histories, Distinguish type of files with File Type, Pipe Handler, Pop CLI V3.0.
● **PAN 17B** AmiGazer 1573 stars to view any time, date or lattitude CLI only, Date Book the diary, bind any text string to a function key, use CLI from a menu, a disk cataloguer Lightning Logger V1.2.
● **SOFT 015** Clip Art 1 Diskfull of low and high resolution clip art pictures.
● **APDC 18** Floppy Disk Utils Quick Copy V1.0, Disk Mapper, Disk Salvage, Virus check, System Utils Blitz V1.0 text editor, TimeSet, ACalc calculator Amiga Monitor V1.1, MeM Grab fast memory grabber. DirectoryMaster V1.1.
● **APDC 15** Icon utilities: full of icon files and creators. Some animated! Brilliant disk for icon manipulation.
● **AMICUS 24** Sectorama disk sector utility, Iconize V1.0 reduce a full screen pic to an icon, BMon system browser, Virus Check v2.21 checks disk & memory, Boing Machine.

DEMO DISKS

● **FFISH 198** CHARON requires 1Mb RAM. It an animated version of the 1915 book by Lord Dunsany. Absolutely stunning graphics.
● **FFISH 200** NotBoingAgain, requires 1Mb RAM, an excellent interlaced HAM animation with sampled sound. The scene is a user who puts a disk into an A1000, a Boing Ball demo loads up and the Amiga disk drive opening turns into a mouth and says 'Oh No, not again!' and spits the disk out! Excellent. Tank the simulated fish tank.
● **FFISH 196** Stunning digitised HAM pictures. Excellent! The quality is astounding.
● **PDOM 01** The Walker Demo I is a mega animation demo that requires 1Mb RAM.
● **PDOM 02** The Walker Demo II the mega mega animation demo that requires 1Mb RAM.
● **PDOM 06** The Mahoney and Haktus sounds of the knome music disk II, great graphics and mega sounds. With a bouncy mouse pointer and things flying evrywhere. A really good demo with loads going on.
● **PDOM 10** Share and Enjoy of Scoopex demos: Scoopex, Hypnosis, Druids, Blank Monk I and II (excellent), AIX 386 and SAE sine intro. Brilliant demos!!
● **PDOM 27** Alcatraz Mega Demo II. MEGA MEGA MEGA!!!!!!

GAME DISKS

● **FFISH 194** Moria V3.0 the single player dungeon simulation adventure game. Requires 1Mb RAM.
● **FFISH 205** Bally the arcade game, Battle Force V3.01 simulated battle between 2 robots. Chess V2.0.



FFISH 205 CHESS V2.0

● **SOFT 042** Chinese Checkers excellent version.
● **SOFT 068** Clue as in Cluedo, Othello, Klondike, Canfield and Cribbge.
● **SOFT 078** Pac Man. Great implementation of the classic game.
● **SOFT 117** Empire, Gravity Wars, Hanoi, Hockey, Bikoff, Jackland, Othello Master, Pacman, all brilliant PD games.
● **SOFT 118** Amoeba Attack, Lander, Gravity Attack, World text adventure and Bullrun a battle simulation.
● **PAN 29B** Amoeba space invaders, CosmoRoids, Stone Age a Boulder Dash type, Back Gammon, Chain Reaction, Master Mind, Reversi, Black Jack, Crazy Eights, Klondike, Jig Saw, Keno, YachtC, Daleks and Ratmaze.
● **SOFT 042** Chinese Checkers excellent version.
● **SOFT 117** Empire, Gravity Wars, Hanoi, Hockey, Bikoff, Jackland, Othello Master, Pacman, all brilliant PD games.
● **SOFT 069** Backgammon, Yahzee, TVision, Missle Command, Cosmo 2 and 3D Breakout.
● **SD 21** Monopoly

GRAPHICS DISKS

● **FAUG 42** DBW Render a very good Ray Tracing utility.
● **SOFT 123** Amiga MCAD V1.2.2 excellent Computer Aided Design package.
● **SOFT 022** Disk Full of graphic utilities: Clip It! clip any part of the screen and save to disk, Filter Pics manipulate pictures with enhancers, edge definition, colour and size shifters, plus loads of excellent packages.
● **SOFT 013** Mandelbrot Explorer. Excellent full features mandelbrot designer.
● **APDC 13** VDraw V1.19 brilliant painting program, Ray Tracer Generator, MCAD V1.2 an object orientated drawing package, IFF to pieces jigsaw program, ROT 3D drawing program.

LANGUAGE DISKS

● **FFISH 171** Sobozon C a port of the Atari ST version of this full K&R C compiler, assembler and linker. It has been tested on an A2000 and appears to work well. Not for the beginner due to lack of disk info.
● **FFISH 193** Zc V1.01 modified version of the Sobozon c compiler from disk FFish 171. It now generates code compatible with A68k assembler and has a front end to allow easier useage.
● **FFISH 140 and FFish 141** Stoney Brook PROLOG v2.3.2. This disk contains the executables & libraries. In addition to providing a compiler SB Prolog also offers advanced features such as dynamic loading, mixing of compiled and interpreted code, macros, extension tables & a debugging facility.
This is a 2 disk set that requires FFish 141 @ £3.00 a disk.
● **FFISH 91** The Adventure Definition Language (ADL).
● **FFISH 201 and FFish 77** Draco V1.2 is a compiled structured language reminiscent of both C & Pascal. A full interface to AmigaDOS & Intuition is supplied. Be sure to get both FFish 201 AND FFish 77 @ £3.00.
● **APDC 25** Logo, XLisp, Modular 2, MVP Forth.

Most of the disks in this advert actually contain more files than is listed.The ad also only shows a small portion of our catalogue, we have in stock TBAG, AMUSE, APDC, PDOM, FAUG, Panorama, Amicus, Slipped Disk and ALL Fred Fish, so for details of the service and a free copy of the catalogue send a Stamped S.A.E. (If you are ordering you will get the latest catalogue). ALL individual disks are £3.00 for 1 to 5, £2.75 for 6 to 10 and only £2.50 for 11 or more!

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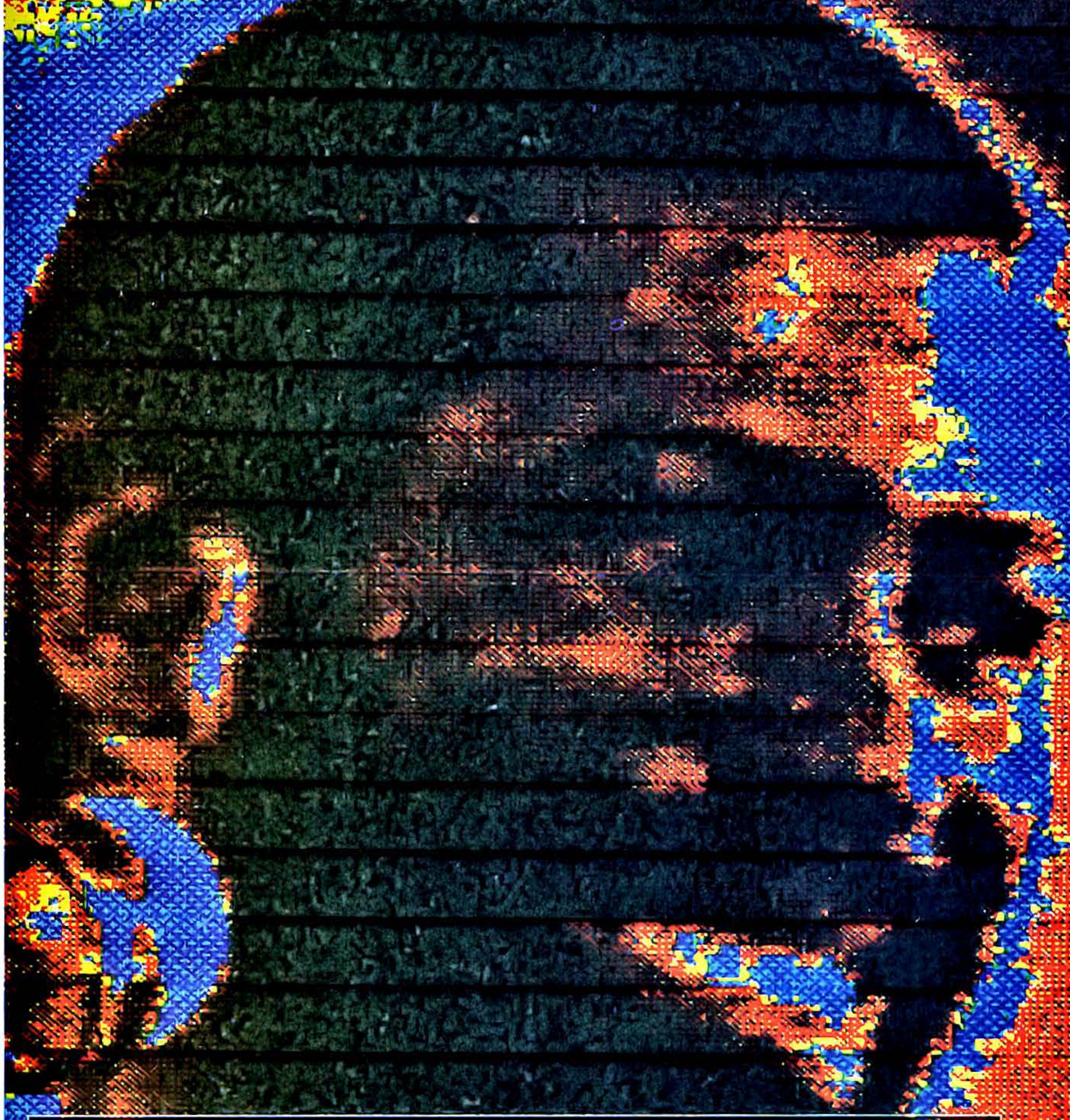
GRAEME KIDD talks to Khartomb, a trio of London designers who are using the Amiga as an integral part of their studio system.

If you haven't yet seen printed examples of Khartomb's work, you soon will. Of course, there's that magazine advert for the Sega with a gladiator in the background: but as a *Format* reader, you'll soon be familiar with a whole host of inlays for Virgin Mastertronic's yet-to-be-launched 16-bit budget label, 16 Blitz. Music lovers familiar with the ACE Records label will also have spotted Khartomb's designs. Increasingly, the creative energy of the Khartomb crew is being channelled through the computer on behalf of clients, and the overall masterplan is to use Amiga and Macintosh kit to produce better work at a lower cost... Of course, it's early days yet. The Khartomb partnership only came into formal existence at the start of September, but the three people in the company – Alex McLaren, Barry Lines and Mark Easton – have already produced some remarkable work.

There are probably only a few hundred fully-fledged Amiga DTP systems in operation in Britain at the moment, but the number of designers and other 'creative' people who own an Amiga is high. As Brian Larkman reveals every month, the Amiga's power-to-price ratio when it comes to creating and manipulating colour images knocks PC and Macintosh systems from the First Division into the Sunday League. Increasingly, designers and illustrators are taking their personal Amiga games machine into the studio, beefing it up with extra RAM and using it as a money-saving creative tool.

When Alex McLaren and Mark Easton joined forces at the start of September to form Khartomb, ▶

KHARTOMB, 204 The Foundry, 156 Blackfriars Road, London SE1 8EN 01 721 7146.



➧ they installed an Amiga 1000 next to their mono Macintosh IICX. An A2000 with AT Bridgeboard is currently waiting in the wings, ready to run a network and add in a bit of PC compatibility.

The duo first met a few years ago when they were employed by a now-defunct software house to produce artwork for software packaging. In those days, they had traditional paste-up equipment at their disposal. Alex entertained himself with a C64, playing games, and never for a moment considered the computer as a tool for producing artwork. When the Amiga was announced he rapidly changed his mind about the potential for computers in a design environment. "I was amazed", he recalls, "and bought an A1000 – which I still think is the best-designed machine in the range, with such neat touches as the garage for the keyboard." It is that same A1000, boasting 2Mb of RAM, that now shares space with a 4Mb MacII on Alex's desk.

"You get in there and if you see a pixel you mug it"

Alex's computerised workstation also features a colour monitor for his Amiga, a lightbox, an RCA mono video camera and an Apple NTX laser printer. Two external drives hang off the Amiga: one is standard Commodore issue, while the other is a Macintosh drive that makes transferring files between disk formats less painful. Alex has experimented with the A-Max Macintosh emulator for the Amiga (reviewed in Issue One), but finds it less useful than his own set-up. The combination of two computers and Mac2Dos allows him to use the best features of both machines, by converting files from Amiga to Mac format and back again. (Alex says that A-Max doesn't run *PageMaker* successfully, so he rarely uses it these days.) The final touch is a spot of customisation applied to the Amiga monitor – with the arrival of ➧

■ On the original Oki output, seen to the right, horizontal bands are clearly visible on account of the way the Oki melts coloured wax. Nevertheless, the image is impressive and shows the kind of effect that could be reached by other, more expensive methods. We've scanned in the printout using expensive professional repro equipment, so the result on this page could be even better than the original (or possibly worse, which would prove a different point!)

CREATIVE USE OF COLOUR – ON A BUDGET

Using the appropriate software, it is possible to use an Amiga or a Macintosh to produce colour separated artwork – the four films that a lithographic printer needs to print the Process Cyan, Magenta, Yellow and Black images that combine to produce full colour on the page (see last issue).

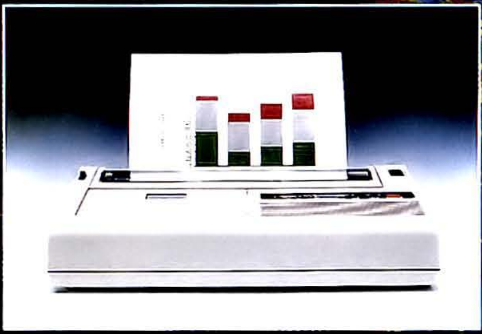
If you have £20,000 or so to spare, then a colour PostScript printer is within your financial reach, and you can use it to produce proofs of colour separation work before it goes off for printing. Of course, the same printer can make high-quality roughs for clients, or even just produce very expensive pretty pictures on paper. If capital is in short supply, you could always go to a specialist bureau for the printout, like The Last Word in London (01 736 7656), but expect to pay up to a tenner a go for your page printouts.

For producing roughs or experimenting with colour effects, however, the approach taken by Khartomb proves much more economical. They've been playing around with an Okimate thermal transfer printer that cost them £140. These machines are getting rare. "Becoming obsolete" according the the person at Technitron we asked, so get in quick.

Serial versions are still available from Technitron (0753 31292) for £173 plus VAT. The colour ribbons for the Okimate are fairly expensive but even so, Mark reckons it's fine for colour roughs and for producing quick visuals. Rather than taking process colour information, the Okimate builds up an image in three passes, one each for Red, Yellow and Blue information culled from the computer driving it.

But there's more. According to Mark and Alex the Okimate is artistically useful, especially for work that would sit well in magazines such as The Face. "You get banding across the printed image, but it can be a good way of producing impressive results, especially if you're working with an amateur snap that doesn't have much artistic value in its own right," Mark explains.

They experimented with the technique for some album covers featuring old soul singers: "The photographs we could source were really bad, so we digitised them in and retouched them before printing them out on the Oki. Sadly, we couldn't get a good enough printout for the final artwork, largely because the banding wouldn't have looked good on an album cover, so we did a black and white laserprint and then added the colour." In the right place, however, the limitations of such thermal printer output could clearly be turned into a 'design feature'...



■ Ribbons can get a tad expensive with heavy use, but with a bit of imagination the Okimate thermal transfer printer can produce stunning results at a fraction of the cost of high-end equipment. Just don't expect too much, and use the output creatively!

XENON TECHNOLOGY

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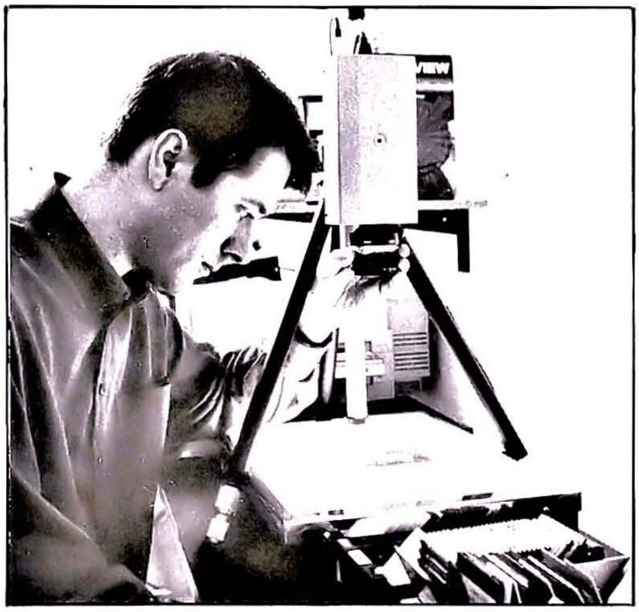
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the latest incarnation of *DPaint*, Alex found that little arrows drawn on masking tape and applied to the edge of the screen help him control the scroll!

So what's the point of this multi-machine system? Wouldn't it just be easier to go for Macintosh kit and forget the Amiga? Possibly, if your hardware and software budgets were very healthy, but the first major advantage of this set-up is the cost saving. Alex can produce work in colour, without spending a fortune. The video digitiser acts as a peripheral for both machines, and with the Amiga set-up there's no need to splash out a thousand pounds or more on expensive colour or mono scanners to capture images. "And I prefer working in *DPaint* to working in *MacPaint*. I'll do a sketch in *DPaint*, save it as a black and white file, and then transfer it to the Macintosh as a *MacPaint* file. It can then be used as a template in powerful Mac packages like *Illustrator* or *Freehand*, and enhanced." Alex is not impressed with with *Professional Draw*: "Version 3.0 will be useful," he predicts.

Shuffling greyscale images from Amiga to Macintosh is a little more tricky than passing files that contain black and white information, which partly explains the presence of that A2000. The current version of *Mac2Dos* can't do what's needed to convert an Amiga IFF file to Macintosh TIFF, so Alex uses an IBM package called *Reflection*. From Amiga to PC via a bridgeboard to Mac: not too much of a pain when you remember that you've saved at least £1,000 as a result of the inconvenience.

Computers feature heavily in the production of roughs and finished artwork at Khartomb. For the Virgin Mastertronic 16 Blitz label, for instance, existing logo artwork was scanned into the Amiga via *Digiview III* and enhanced. "I use



■ Alex McLaren in front of the camera. It's a standard RCA mono unit, but rather than use video camera lenses Alex has fitted a C adapter that allows him to attach Olympus camera lenses for better quality input. Flat artwork is scanned in using one lens, and a closeup lens is used in conjunction with the lightbox to scan transparencies. While Alex is the man with most computers on his desk, Mark Easton and the third member of the team, Barry Lines, are also thoroughly computer literate.

Digiview by preference, as it now has a line art mode," Alex explains, "and once the image is in the Amiga I use *Pixmate* to clean up stray pixels that have turned up. It's a lot easier to do on the Amiga than it is in *MacPaint*. We call it Pixel Mugging: you get in there, and if you see a pixel on its own you mug it. *Photolab* is our first choice after *Digiview*, by the way."

"For the time being we want to get black and white to a high standard," Mark explains, "but we have been researching colour, which has involved experimenting with the output of a £140 Okimate printer and with the output of someone else's £23,000 QMS colour PostScript printer. We're hoping to get to the stage where we can produce four-colour film sets for our clients and save them a fortune on repro bills. We'll probably end up producing semi-finished filmsets and then sending them on to a repro house for separations of full-colour pictures to be added."

Apart from the cost saving to the client, there's another benefit: "Working that way will mean that, as designers, we won't be inhibited by the repro costs. We'll be able to do as many tints, drop shadows and so on as we like and the client won't have a heart attack about the repro bill." On the purely creative side, the Khartomb team is experimenting with using the computer to add colour to digitised images, and specifically for their work in the music industry, with grabbing video frames and reworking them.

Everyone at Khartomb is impressed with the potential of Alex's Amiga/Macintosh system. For a start it gives everyone more time, and inevitable mistakes and amendments are rendered relatively painless. Mark explains: "All our work is done against a deadline, and we've found that we can get a job up and running very quickly by using computers. We're then in a position to do many roughs, rather than forcing a client into accepting early work because there simply isn't time to rework a rough. All the intermediate processes are speeded up using computers, so we have more time within the deadline for creativity."

"In the days of 'magic marker' or 'rubdown roughs', if the client wanted changes then you came back to the studio and rang your girlfriend to say you'd be in hiding for a week. Even with the Okimate printer we can produce roughs that give the client a good impression of the job, we can produce them much quicker and make changes relatively easily. Our clients get a better service."

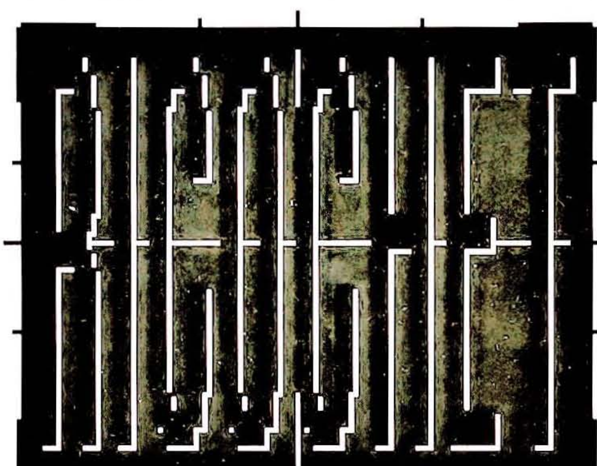
And the computerised way of working is likely to allow Khartomb to take on jobs that would previ-

"With the Amiga, there's no need to splash out on expensive colour or mono scanners to capture images"

ously have been refused as too time-consuming or uneconomical. For instance, ACE Records produce an annual two-colour catalogue with some 700 items spread over 50 or more pages. "We've turned away work like that in the past," Mark says, "but with adverts to do for them every month, we'll be digitising sleeves as we go along. At the end of the year, producing the catalogue will largely be a matter of repaginating the ads. The main body of the work will already have been done and stored on disk where we can get at it. In the future, we'll be able to do that sort of work... although working digitally means there's a danger to the client in that they might feel obliged to use us on grounds of economy!"

Like the Khartomb partnership itself, the arrival of computer equipment in their studio is still a recent event. "We haven't found the limits of its application," Alex says enthusiastically, "we're still looking to see how far we can stretch the equipment." ■

■ A few samples of the kind of logo artwork Khartomb have produced on the Amiga.









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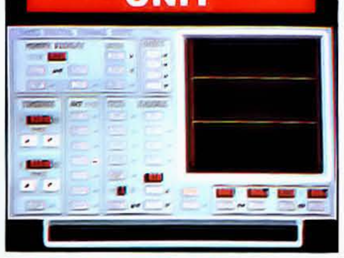
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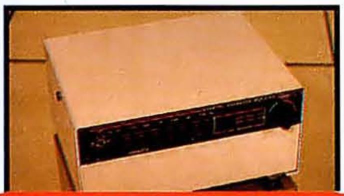
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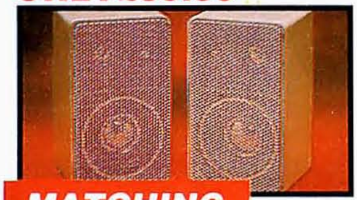
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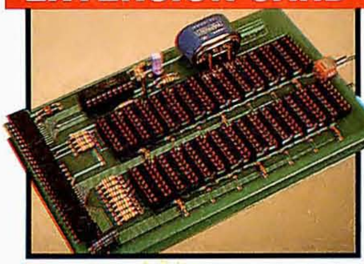
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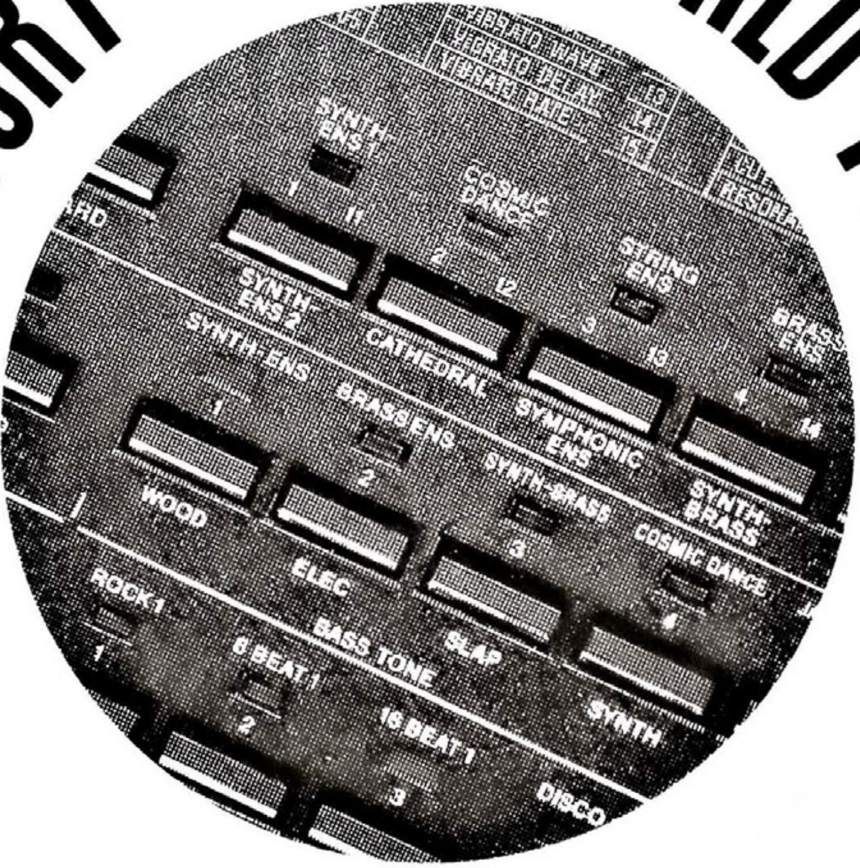
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THE HISTORY OF THE WORLD PART ONE



Or of the synthesizer, anyway. If it was around in 1905 and weighed in at 200 tons, how come they can fit one in your Amiga? **JON BATES** explains.

We all know by now that the Amiga's capability for creating and reproducing sound is state-of-the-art for a home computer. But how do you go about it? What is the difference, for example, between creating sound and just reproducing sound? Come to think of it, how is sound synthesized anyway? Answers to these and other pertinent questions are yours if you get stuck into this month's *Amiga Format* music tutorial.

A Spot of History

I won't bore you with the history of the synth, except to say that it was indeed around in 1905 and did really weigh in at around 200 tons. Like all things electronic, the history of sound synthesis mirrors developments in electronic components. Just like ancient computers, ye olde synthe was a semi-mechanical beast with heaps of valves: but transistor and microchip technology is reflected by quantum leaps in the shrinking of the synth.

Most of the early machines were bizarre and experimental, but truly commercial synths finally came onto the market over 20 years ago. These were what is known as analogue synths. If you have trouble with the difference between analogue and digital, think of watches. An analogue watch is a clockwork one with mechanical hands: its operation is always a concrete, physical reality. In exactly the same way, the electrical signal which creates the sound in an analogue synth is always a physical phenomenon.

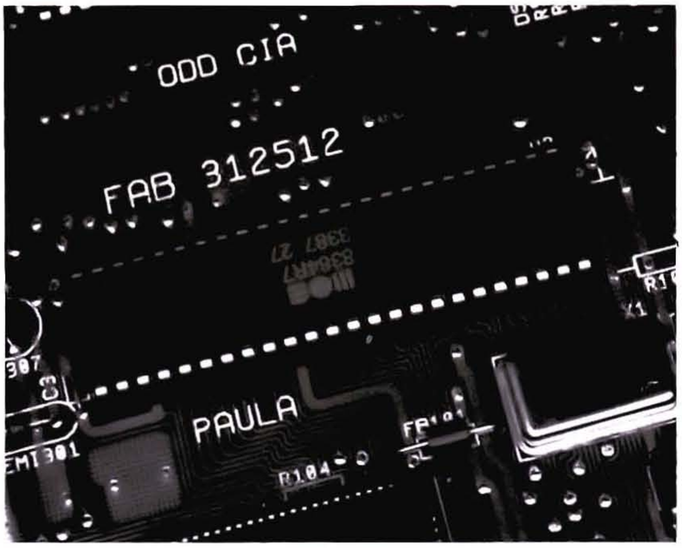
Analogue synths work by bunging out a raw electrical signal which is first shaped into a basic sound wave (using oscillators, if that means anything to you). To give an individual tone and shape to the sound, electricity is then applied directly to it. The amount of electricity applied is directly proportional to the amount the signal alters: and this is where the description 'analogue' comes from, the cause (amount of electricity) and the effect (amount of change in the signal) being directly analogous.

Much later we get digital synthesis, which in some respects is still in the stage of growing up. Very briefly, digital techniques vary from analogue ones in that the electrical signal does not remain a physical reality: rather, it is sliced up and each slice is described as a number. If you think of the way a graph describes a line by plotting each point in turn, you're getting close. The analogue equivalent would be to scribble the line with a pencil. ▶

There are many paths to creating sound digitally, not merely one, possessing such mind-numbing names as Frequency Modulation, Cross Wave, Linear Arithmetic, Sampled Sound, PCM, PhaseDistortion, Vector Synthesis, DASS, AWM and so on. The list is as endless as the inventive ingenuity of the Research and Design department and the dubious talent of the Marketing copywriters to come up with new acronyms. And totally meaningless without a deep dive into the details of sound physics which, with your leave, we will avoid for now.

Oh, and there are also digital synths that think they are analogue synths. Or at least this is what they are told to think. Basically, the reason for this strange little explanatory preamble is simple. Depending on which software you are running, the Amiga sound chip can actually pretend to be either digital or analogue. Obviously it has to be a digital sound creator at heart, because it does not have varying amounts of electricity induced into it.

However, it can create sounds in two ways: either by translating a digital sound that is fed into it: or by actually constructing the sound from raw information that is fed into it, after reference to digital wavetables. The controlling software will determine the extent to which the sound can be shaped. ■



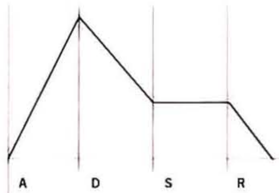
■ Paula, the sound chip that lurks within the depths of your Amiga.

SUBTRACTIVE SYNTHESIS

This was almost the universal method of creating sound before the advent of the digital synth. How it works is this: the waveform starts off being a whole big wodge of noise just blatted out from a sound generator, containing heaps of different tones. It is then put through a filter, which gives it a single, distinctive tone quality.

The resulting single tone is then fed through an 'envelope', which gives the sound a 'shape'. This shape has nothing to do with the pitch or tone: it simply represents the way the volume of the sound changes, when you first hit the key, and when you take your finger off the key. The component parts of the sound envelope are traditionally known as ADSR, standing for, Attack, Decay, Sustain, and Release.

Attack is the time it takes from when you first bang the key for the sound to reach its initial peak; Decay is the amount it falls off after that; Sustain is the level which it will hold as long as the key is held down; and Release is the amount of time it takes for the sound to die away after you have taken your finger off the key. So a sound like this:



will come in quickly , drop down to a quite a low level, and decay away with only a little bit of sound hanging on after the note has been let go. Such a sound could well be a piano.

The idea of a controlling envelope can also be set to work on the filter to affect the tone: which results in sounds that alter in tone as long as a key is held down. Try saying the word 'wah-wah' for an instant demonstration of this principle!

The whole process is called 'subtractive' because parts have been taken away from the original wodge of sound and it has then been moulded into the particular shape that is needed.

Not the Whole Story

The sound can be altered by many other variations: to start with, the basic sound source before it is filtered or shaped can be changed. Analogue synths usually offer several different waveforms, each of which has a quite distinctive tone. The most usual ones are Sine, Square, Saw Tooth and Ramp. They can often be mixed together to create a complex sound.

Apart from the sound source, another device found on many synths is an LFO, standing for Low Frequency Oscillator. You pick the waveform of the oscillator, set the frequency of the wave, and decide what aspect of the sound you want it to work on. A sine wave working on the volume of the sound, for instance, will make the sound get louder and quieter; use a square-wave LFO and it will pretty well switch on and off. LFO can usually be set to work on the filter as well. LFO is used often to create 'vibrato' or 'tremolo' effects, which are rapid alterations in pitch or volume respectively.

One interesting effect is that if you speed the LFO up, at its fastest rate it will start to create a completely new pitch with a new tone. This is the crude basis of Frequency Modulation, which Yamaha developed: and as a result they cleaned up for several years in the synthesizer world. ■

ADDITIVE SYNTHESIS

The opposite of subtractive synthesis, surprise surprise, is additive synthesis. You start with a very simple waveform and then combine it with another simple wave form. Instead of simply adding them together, though, you use one to affect the other. The result is a very complex



■ A modern Casio synthesiser.

VOICING SOFTWARE: WHAT IT IS

The computer, when used in creating sound, has certain restrictions. The internal sound chip, unless it is very powerful, will take a secondary role to that of the image and processing chips, since the Amiga is designed to be a multiple-use machine and not a dedicated music computer or instrument. However, dedicated digital instruments have one enormous drawback: they are all a real pain to actually create and tweak up sounds on. Small LCD screens and a whole host of sound peripherals make it one big headache from start to finish. Indeed the number of synths that return back to the factory for repair and contain the factory set sounds far outweigh those returned with new sounds.

Nowadays, the new synth is not many moons out of its box before additional sound cards are tempting the buyer. It is actually cheaper and much more efficient to use the power of your Amiga, to hook up the synth via MIDI, and use voicing software as a means of both creating voices and, of course, storing libraries and banks of sounds which you can chop and change around with ease.

Many synths nowadays are also multi-timbral tone modules with performance set-ups, key-

waveform: far more complex than you could create with such simplicity using analogue synths.

The process is known as Modulation, but since the sound is built up from simple sources and not big full frequency ones, it is called additive. The most widely known use of modulation is the form employed in the Frequency Modulation synths from Yamaha. Interestingly enough, Yamaha picked up the ground work on FM way back in 1974 from an American acoustic scientist, John Chowning. He had tried to sell the concept to several leading US electronic instrument makers who stared at him blankly. Meeting with Yamaha research and design people, he found that they were some way down the paths he had already trodden. You can guess the rest.

If you can use two wave forms, then why not use four, or even six? Traditionally Yamaha FM uses only sine waves and in different configurations called Algorithms, which describes the way that they inter-react and stack up. The waveforms are so complex that the close imitation of acoustic instruments is a certainty.



■ The Casio FZ-20M : at the leading edge of digital sampling, but will they produce a cheap FM synth?

Instead of using sine waves, why not use small samples of real instruments, inter-reacting in much the same way? Roland LA, Kawai cross-wave and Korg AI synthesis use very much this idea, plus you can also shape up the samples themselves. Now we are getting synths that use combinations of samples and waveforms stacked up in all types of configurations. Rumour has it that Yamaha have a similar system poised for launching in 1990 and it wouldn't surprise me to find that Casio will come out with a £99 wonder by Christmas 1991. ■

SOUND RE-CREATION

Most Amiga music programs, and games programs for that matter, use the sound chip to convert sampled sounds from digital to audible analogue. While an in-depth sampling tutorial is still on the cards, this month I'll only cover it as far as voice re-creation goes.

Sampling is the encapsulation of sounds digitally: the analogue sound-wave is sliced up into digital data at very high speed and then stored. Thanks to the Amiga's IFF files sounds sampled and stored by any Amiga sampling software can be played back on any other: this common use is possible with any IFF files, of course. The Amiga cannot sample without the addition of extra hardware; by reading the sample data into the sound chip, the original sample can be played back.



■ The Akai S1000 sampler: a good example of a dedicated sampler.

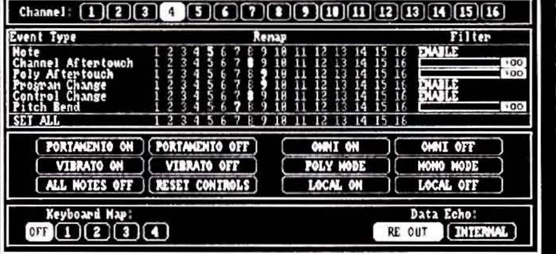
Its use of digital sampling techniques is what allows the Amiga to produce such life-like instrument sounds. There are also programs that will allow a certain amount of interference with sound samples.

Future developments for the internal chip?

I must admit that I am waiting for a software house to come up with a program that imitates the way that many of the new synthesizers create sounds. Although it has many different names, such as Linear Arithmetic, Cross Wave, AI, RS-PCM, the principle is roughly the same for all. You take little small portions of sampled sounds and mix them together, much in the manner of FM synthesis. The other little gem which I figure should be possible is to actually use the Paula chip to do a simple form of FM. All software houses developing such programs are requested to get on the hot line to me now, c/o the *Amiga Format* office!

Amiga Format welcomes letters on music and technology, and any problems you have I will be only too pleased to deal with. Perhaps you have views you would like aired, maybe you are not certain which piece of music software to buy. Write in and we'll make sure that your letter is dealt with ■

board set-ups, multiple output settings, stereo panning and all the bells and whistles you can imagine. It means far less time spent puzzling your way around the way in which the synth works. In fact, I speak from first-hand experience when I say that using voicing software helps you to understand the way in which your instrument works far better than any amount of poring over the manual will. Often you get a set of free voices and many of the voicing programs will randomize sounds: that is, give you sounds at random, but within certain sensibilities so that they can form a basis for sounds you might like to use. Reviews of individual synth voicing programs will follow in future issues of *Amiga Format*.



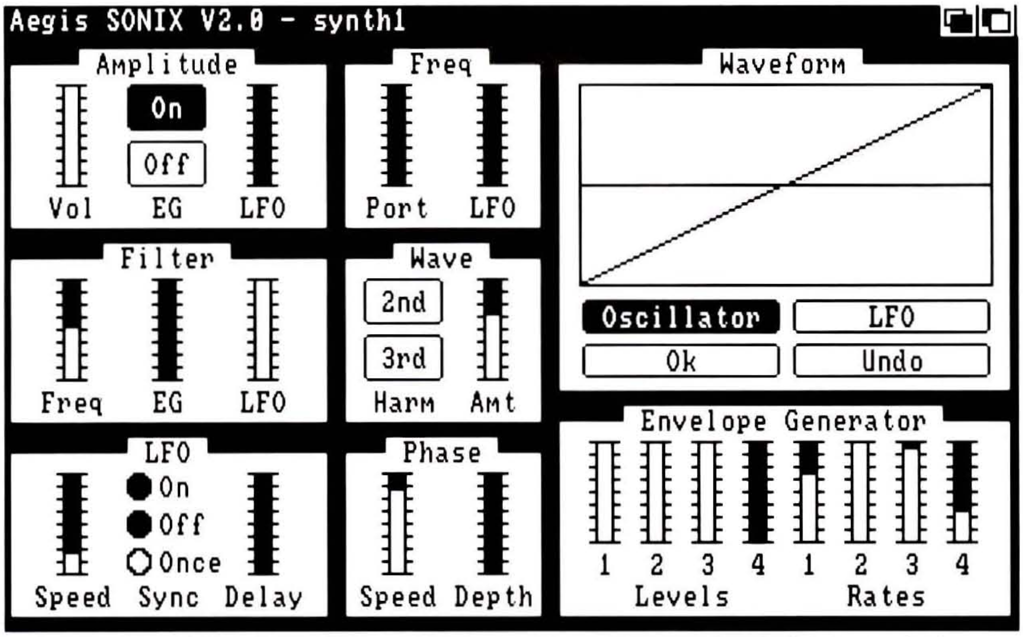
■ MusicX is just one example of the kind of program that makes voice editing simpler.

SONIX TUTORIAL

Aegis' *Sonix* is useful to learn soundchip programming with.

Turning now to consider the act of creating sound, one of the best programs for this is Sonix. Sonix does a very fine job of turning the chip into a sound creator, much in the manner of an analogue synth. Since it has been around for some time now there are probably many people who have played around with it. Here is an in-depth guide to the features of this program which will maybe act as a user-friendly intro to sound creating.

The screen is laid out into eight sections. To the left of centre are the various sound areas. The place to begin is the waveform display on the right. From the menu you can pull down a preset waveform, or if you fancy you can draw your own, although surprises are in store if you try a square wave as the screen can't cope with vertical lines.



■ **First step is to click on the oscillator and draw a waveform. Then experiment with the Amplitude.**

The button to click is 'Osc' as this will set your waveform as the basis of the sound. Next thing is to make sure that all the sliders in all the sections are set to zero. Put the filter frequency slider up. Now go to the top left-hand Amplitude section, click the EG off, and raise the volume. That will give you the sound in its raw state with no shape or filtering.

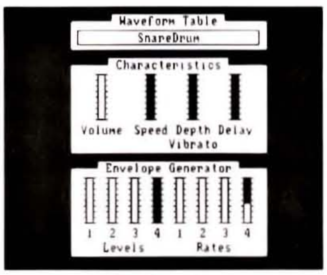
Switch it to EG on and the result will be large amounts of nothing! That's because the levels of the envelope generator are set to nought and consequently no sound is getting through. Over to the Envelope generator and set rate 1 and level 1. The level is the rate to which the Attack will rise and the rate is the speed at which it will do it. A low number 1 rate means that the sound will crawl in slowly. As you might expect, 2, 3, and 4 correspond to Decay, Sustain and Release.

Now add level 2 and rate 2. The sound should crawl in and fade away. A tip here is to set rate 4 (release) on full rate and level 0. This means that the sound will not carry on after you have released the note. You will have to experiment with differing levels for these as they are inter-reacting; the level and rate of one will have an effect on another.

This is shaping the sound: matching the volume to the time it takes for the sound to play.

The envelope generator will also work on the tone and change that as the sound plays. To hear the full effect go to the Amplitude section, turn the EG off, then drop down to the Filter section and bring the EG slider up. This determines the amount of control the EG has over the tone, just as it did on the volume. The filter should still take out certain frequencies. The lower the slider, the more it is filtering out, rather like a pair of sunglasses. This filtering is done before the EG has chance to work on what is left.

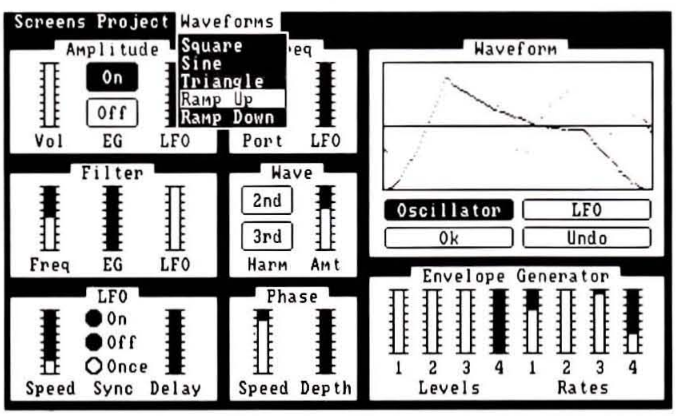
Repeat this experiment, but this time use the LFO section in either the Amplitude or Filter sections. To find out about the LFO workings, go back to the waveform display and click on LFO. The waveform displayed is for the LFO and you can either redraw it or pull one down from the menu. You can also apply LFO to the pitch: the section is called Frequency. More LFO equals a wider wobble to the note. Port in this section is short for Portamento which here means the speed at which one note will glide to the next one played.



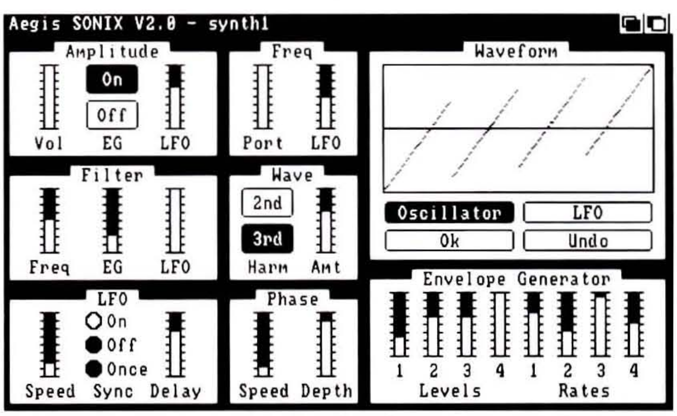
■ **Characteristics of a snare.**

Another feature for you to explore is the Phase section, which is great for thickening up sounds if applied in modicum (if you apply it in strength you can create sci-fi sounds very easily). Wave actually looks at the waveform and when 2nd is pressed it takes it up an octave: 3rd will take it up two octaves.

All sounds can be stored and with not too much bother you can emulate very easily a sound synthesizer: it will play from an external MIDI keyboard too, although you will always be restricted to four notes at a time. ■



■ **Setting a new waveform from the menu: in this case, a ramp.**



■ **The levels and rates of the Envelope Generator in full effect.**

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The BASIC language has come a long way since its humble beginnings in the early 1960s and the AmigaBASIC interpreter supplied with your computer is witness to this transformation. However, although AmigaBASIC is good, you can do even better ... with HiSoft BASIC.

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Requires

- Lattice C 5 runs on the A500 up but will certainly benefit from 1Meg of RAM and, for large programs, a hard disk.
- Lttice C++ needs 1.5Mb memory and a hard disk.

Price

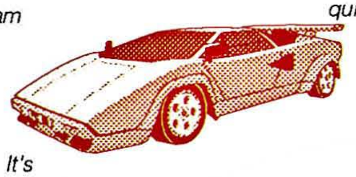
Lattice C 5.02 £229 inc., **Lattice C++** £299 inc.

HiSoft Devpac ver 2

We've said enough in this ad, let's hear what the press have to say about Devpac Amiga:

Editing, assembling, debugging and even program execution from the same place - not fantasy but something offered by Devpac. Fast assembly speed, powerful directives for optimising code, extensive conditional options, symbolic debugging ... Devpac has it all plus a lot more. It's packed with features and has everything machine code program developers could want.

ST/Amiga Format 12/88



With release 2 of Devpac Amiga, HiSoft has greatly enhanced its already excellent 68000 development system, making it quite indispensable for the serious programmer.

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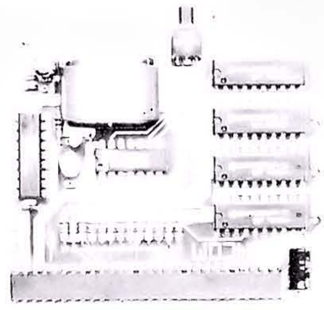
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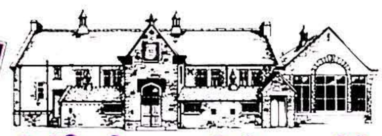
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WORKBENCH

Discover the inner depths of your Amiga with our feast of tips and tricks to help you get the most from your machine. Meanwhile, **JASON HOLBORN** answers more of your Amiga queries...

A THICKET WRITES

I bought my Amiga a couple of months ago and I think it's great. What most impresses me about the Amiga is its graphics and music and I would therefore like to perhaps delve into a bit of programming myself.

What I would like to be able to do is to produce graphics and music demos, but unfortunately I'm a bit of a thicket. What I need is an easy to use, but powerful programming language that is backed up by several books to help me learn to program graphics and music on my Amiga. I have no background knowledge and therefore it needs to be suited to a beginner such as myself.

I have heard about Commodore bringing out Super Denise and Agnus chips and was hoping you could tell me when these will be available and how much they will cost. Is it true they add an extra 512K of memory to your machine therefore upgrading a 512K Amiga to a full 1 Megabyte?

SIMON GREEN
CONSET, CO. DURHAM

Instead of looking for a programming package such as Devpac 2 (which really isn't for the beginner), have you tried playing around with AmigaBASIC, the BASIC interpreter which comes with your machine. For a beginner, BASIC really is the best start you can get in the world of Amiga programming as it will teach you many concepts which are transferable to many other languages such as C. Because every Amiga owner has AmigaBASIC, there is a vast number of books to choose from which will take you from the very basics of BASIC, to some really advanced programming.

Alternatively, if AmigaBASIC isn't your 'cup of tea', Mandarin Software are soon to release AMOS, a BASIC-like programming language which allows extensive control of the Amiga's special capabilities. According to Mandarin, AMOS will allow the same level of control of the Amiga as languages such as C and Assemblers (although the techies among you will probably take this with a pinch of salt!)

Commodore are indeed developing a new set of custom chips in the form of the new ECS (Enhanced Chip Set) upgrade. According to Commodore Technical Support, the full enhanced chip set (Agnus, Denise, Paula and Gary) is still in development and will therefore be a long time coming (don't expect to see them either this or next year!)

Even if you did get them early, you'd still need Kickstart 1.4 to be able to use them. The ECS will not actually give your machine any extra memory, either. The current custom chips can only access the first 512K of memory (chip memory) but the new ECS allows the custom chips to access a further 512K, therefore raising chip memory to a full megabyte. To take advantage of this, you will have to increase the amount of RAM in your machine by purchasing a RAM expansion (such as Commodore's official product, the A501 512K RAM board).

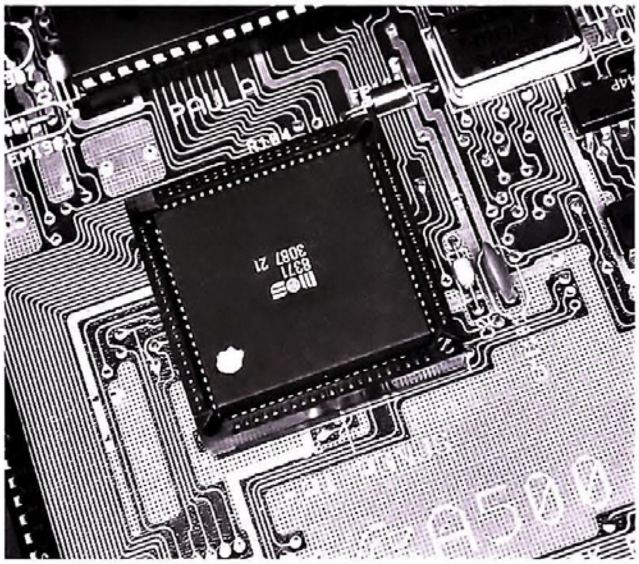
KERNEL ENQUIRY

I, and a few others, would like to be able to use the Amiga ROM Kernel 'library' routines from AmigaBASIC, but don't know how to. I know the names of the routines and how to call them, but I don't know which, and in what format parameters must be passed to them.

With these routines being such an important part of the Amiga, one would think that Commodore would have documented them a lot better within the AmigaBASIC manuals. I have purchased Ariadne's 'Kickstart Guide To The Amiga' and have found some of the listings very interesting. Can you help?

In an ideal world, Commodore would have completely documented every single routine within the Amiga ROM Kernel, but because of the sheer number and complexity of them, it would have been almost impossible to completely document them without having to resort to issuing the AmigaBASIC manual in volumes.

The official documentation for the Kernel routines is contained within Addison-Wesley's 'ROM KERNEL MANUAL: Libraries and Devices' which documents all the ROM routines for version 1.2 of the operating system (a 1.3 version is due eventually). This book costs about £35 but must be seen as invaluable if you're serious about your programming.



■ **Within the next few months (or maybe years) Fat Agnus will put on more weight within the all-new Enhanced Chip Set.**

MEMORY MATTERS

Like many other amateur Amiga owners, I am soon to shell out £100 for a 512K RAM expansion of my Amiga 500. However, after browsing through the adverts within *Amiga Format*, I feel that a special review of the boards available is needed. Is a RAM disable switch worth investing in and will I invalidate my warranty by fitting a RAM expansion?

IAN KEWLEY
ORMKIRK, LANCS

Features such as 'Buyers Guides' are one area which we are currently looking into and which you

can exoect to see in future issues of Amiga Format. Memory expansion is one particular area that is sure to be covered. Some games software is written rather sloppily and therefore doesn't always work if your Amiga has extra RAM. As a result, having a RAM disable switch can be very useful to allow you to use these games without having to resort to removing the board itself. Fitting a RAM expansion to your machine shouldn't invalidate your warranty.

AMIGA 64?

Looking through Issue 1 of *Amiga Format*, I noticed an advertisement on Page 22 for a Commodore 64 Emulator from USA software house, ReadySoft Inc. I have recently upgraded from a Commodore 64 and as such, I have loads of Commodore 64 games which I used to enjoy playing. Could you please answer the following questions:

1. Firstly, does it actually work?
2. How does it work and do I need some extra hardware to be able to use it?

KARL DRINKWATER
STRELFORD, MANCHESTER

1. The simple answer to this question would be 'yes'. Unfortunately, it's not that clear cut. Although ReadySoft's emulator will run the vast majority of software (including games), it is considerably slower than a real 64. If you wished to use the emulator to run business software, then it would be worth the investment, but for games you'd be best advised to save your money and try and pick up a second hand 64.
2. The 64 emulator is both a hardware and software based emulator. The vast majority of the emulation is handled within software, but an additional hardware add-on allows you to connect C64 disk drives (including the incredibly speedy 1541!), therefore allowing you to read and write C64 disks directly from your Amiga.



■ The Commodore 64 which, perhaps surprisingly, is more like a C64 than the Amiga will ever be. (See "Amiga 64").

SOME HARD QUESTIONS

After having read a number of interesting articles in *Amiga Format* and your sister magazine *New Computer Express* (no plug intended – Ed), I have come to the conclusion that I need a hard drive and I would appreciate it if you would answer a couple of questions.

1. I have decided (rightly or wrongly) to go for the Commodore's own A590 mainly because of the ability to 'piggy-back' drives together. If I add an additional drive at a later date, would the computer treat the two drives as one single drive, or would I have problems accessing data from the different units?
2. How do I run commercial software (games mainly) with a hard drive attached? Most of the programs don't allow you to back them up to hard drive, nor will they work from the Workbench. Would it be safe to operate the computer with the hard drive switched off therefore allowing the commercial program to autoboot?
3. To allow me to autoboot from a hard drive I need to upgrade to Kickstart 1.3. Could I do this easily myself? The computer is over a year old and therefore the warranty has expired.

JIM CAMPEY
BRENTFORD, MIDDLESEX

1. If you connect additional SCSI drives to the A590, you will have to set dip switches on both the A590 and the extra drive so that the Amiga can differentiate between them. Apart from this, you shouldn't have any problems.
2. The designers of Kickstart 1.3 were a clever lot and they have therefore already taken this problem into account. When you turn on your machine with a hard drive attached, the machine will first check to see if a bootable disk is in the internal drive, and if one is found, your Amiga will then boot from floppy instead of hard drive. If no disk is found, control is then transfered to the hard drive.
3. Check out last month's issue of Amiga Format, which includes a complete D.I.Y. tutorial on fitting Kickstart 1.3 to your machine. You can buy the chip from HRS on 021 789 7575 for about £15.

BAD DISKS?

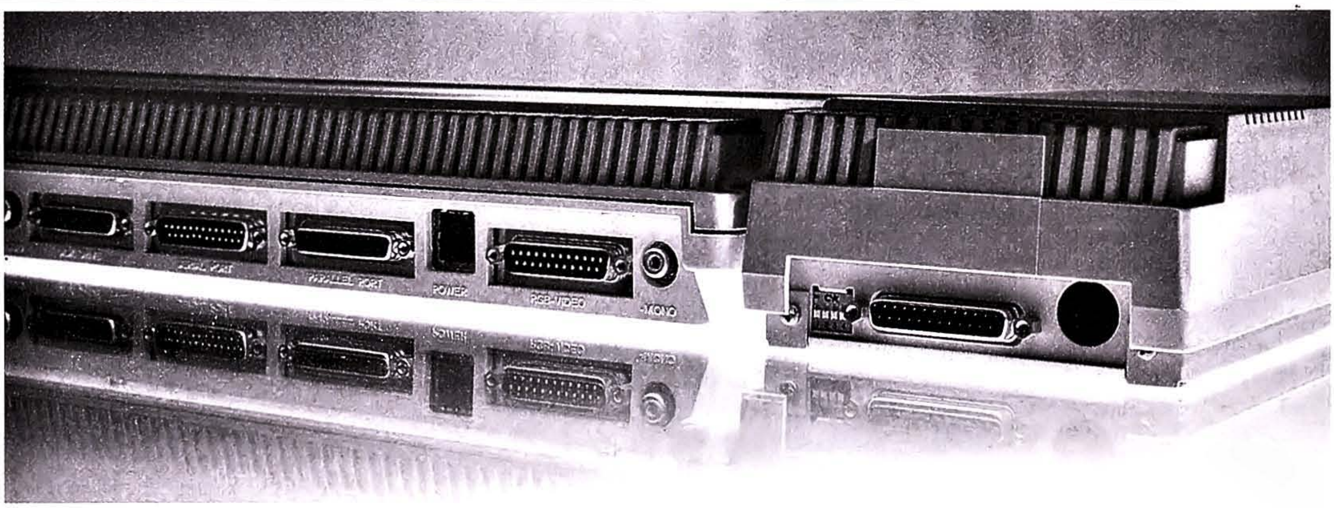
I was wondering if you had tried out the B.A.D. disk optimiser which claims to speed up the Amiga drives by about a factor of five. The main question is, would it work with commercial software such as games?

P V SEAL
DARTFORD, KENT

The simple answer is no. Because of the copy protection on games software, the vast majority use custom disk formats that are not true AmigaDOS format. BAD was designed to optimise AmigaDOS format disks and therefore it would probably cause serious damage to the vast majority of protected software. The rule is: if it's copy protected, then using BAD could be bad news.

GOT A PROBLEM?

There's no need to suffer those sleepless nights of worry. Wipe away those worry lines by sending your worried words to the *Amiga Format* Workbench Helpline. Obviously we can't enter into personal correspondence, but if you've got any questions, then we'll try our utmost to answer them as fully as possible within these pages.
Send your troubled words to: WORKBENCH HELPLINE, AMIGA FORMAT, 4 QUEEN STREET, BATH BA1 1EJ.



■ Commodore's own A590 hard disk drive. But can you use lots of them together? (See "Some Hard Questions" for the answer...)

ST incarnation, the utility has been used to create some quite stunning arcade games that have even been sold commercially.

If raw speed is what you're after, then assembly language is your only choice. Contrary to what some compiler manufacturers will tell you, no other language can even start to compete with the raw power and speed of assembly language. If assembly language sounds like your cup of tea, check out Argonaut's 'ArgAsm' assembly language development system (we reviewed it in last month's issue).

Books wise, If you wish to learn assembler programming on the Amiga then there are three books you should be seriously considering. The first is Abacus' 'Amiga Assembly Language Programming' which should teach you assembler and the final two are Addison Wesley's 'Amiga Hardware Reference Manual' and Abacus' (again) 'Amiga System Programmers Guide' which are both indespensible reference books for all good games programmers.



■ **How to transfer C64 software to your Amiga? See "Talk to Me!"**

TALK TO ME!

I wonder if you could help me. My problem is that I've got a large BASIC program that I've written on a Commodore 64 and I would like to transfer it to my Amiga 500. I don't want to have to type it all out again.

I have a Commodore 1541 disk drive and I've bought a cable which connects the disk drive to the parallel port on my Amiga but I just can't seem to get the two to talk to each other. Help!

A Dudman
Swindon, Wiltshire

Just plugging peices of hardware into your Amiga because you've got a lead that seems to fit both is a dangerous thing to do: you could do serious damage to both the Amiga and your C64 disk drive!

There are three different ways you could transfer your program. The first method would be to connect a serial cable between the C64 and the Amiga and uses Comms software on both to transfer the file that way. Another solution would have been a little widget marketed in this country called Precision called Access 64 that allows you to connect C64 peripherals to your Amiga and use them as you would standard Amiga devices. Unfortunately, Precision tell us that the device only works on the A1000 and so unless you're lucky enough to own that machine then you won't be able to benefit from this.

The other alternative to to treat yourself to ReadySoft's C64 emulator which includes an optional adaptor to allow you to plug in your C64 drive.

DIGITAL DUMPS!

I've noticed when looking through your recent issues that you've stopped using screen shots like other magazines and instead, have started using what looks like screendumps. What package do you use to lay out your pages? *Professional Page* perhaps?

Secondly, how do you actually grab screens for use within *ProPage?* I've seen the Workbench Grabscreen program but your mystery program seems to grab screens from just about everything!

W Smithson
Dundee

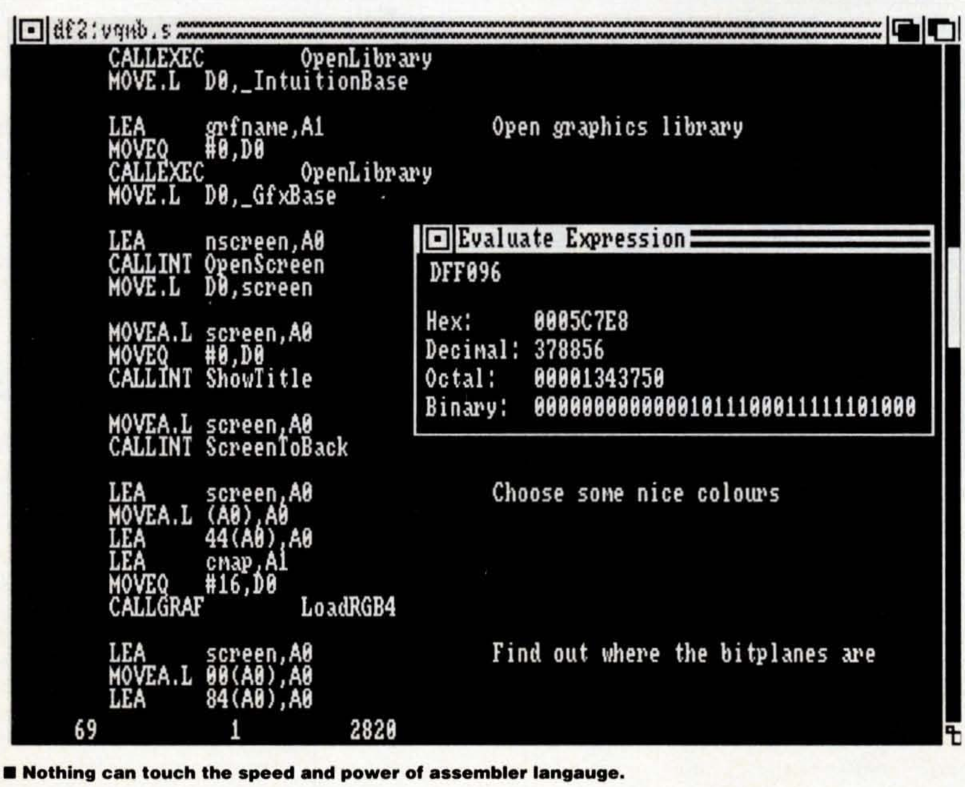
While we still use screenshots on games pages, we do indeed use screendumps whenever we feel they are required. For games, it's always best to stick to screenshots (or 'trannies' as the art people call them) as the pictures are more natural. Trannies can be blown up to quite a large size without any loss of quality whereas screendumps can end up being rather blocky. However, when reviewing a product such as Music-X, where detail is all important, screendumps give the best possible resolution.

We must admit, we don't actually use Amigas to lay out our pages. Instead, we use powerful Macintosh II computers running a Mac DTP package called Quark XPress. However, the Amiga is used extensively for image processing of screendumps to

WHO YA GONNA CALL?

There's no need to suffer those sleepless nights of worry. Wipe away those worry lines by sending your worried words to the Amiga Format Workbench helpline. Obviously we can't enter into personal correspondence, but if you have any questions, then we'll try our utmost to answer them as fully as possible within these pages. Send your troubled words to:

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▶ Workbench, the way to use extra samples on an expanded Amiga is to force the *Sonix* program into fast memory. But how to do this?

Simple. What you must do is to copy the program 'FASTMEMFIRST' from your Workbench disk across to the *Sonix* program disk. Next, edit the *Sonix* StartUp-Sequence (to be found in the 'S' directory) so that FASTMEMFIRST is always loaded and runs first, before anything else happens. This will then force the *Sonix* program into Fast Memory.

ANDREW RODDIS
LISBURN, CO. ANTRIM

HARDWARE HACKING CORNER

The addition of a second drive to the Amiga is viewed by many as more of a neccessity than a luxury. Unfortunately, because drives are automatically configured by the operating system, this uses working RAM. What's wrong with autoconfiguring? I hear you ask. Well, because some aspects of disk reading and writing is handled by the Blitter, adding external drives uses up valuable chip ram.

Each disk drive requires a 30K buffer for file management. While 30K may not sound like a great deal, once it has been allocated, it cannot be released. Fortunately for the adventurous among you, you can avoid the hassle of having to unplug your external drives every time by fitting an on/off switch. The switch breaks the line that informs that an external drive is connected to the system, therefore the Amiga ignores it.

What you'll need is a single-pole, single-throw switch (SPST if you prefer) and a soldering iron.

Firstly, unplug the drive and open up the connector and locate pin 21 (SEL1) and then cut the wire, leaving enough on each side to connect a switch. Next, solder a switch between the two ends and mount it somewhere nice and safe. Finally, reassemble everything carefully and then you can plug in and go. Simple eh!

BARRY WHITEHOUSE
FROME, SOMERSET

TECHIES CORNER

The Blitter is a complicated (but very powerful) beastie at the best of times, so here's a short assembler routine to allow you to carry out the simplest of Blitter operations – copying data, unchanged, from one area of memory to another.

The source code is self explanatory: all you do is to firstly tell the Blitter what operation you want (the minterm), give it the source address, the destination address, the modulo source and destination jump offsets and then finally the width and height of the operation. Writing to BLTSIZE will then start the Blitter.

```
BLTCON    EQU   $DFF040          ;AMIGA HARDWARE ADDRESSES
BLTDPTH   EQU   $DFF054          ;REFER TO THE 'HARDWARE
BLTAPTH   EQU   $DFF050          ;REFERENCE MANUAL' FOR THEIR
BLTDMOD   EQU   $DFF066          ;MEANINGS.
BLTAMOD   EQU   $DFF064
BLTSIZE   EQU   $DFF058

BLOCK_MOVE:
    MOVE.W   #$09F0,BLTCON                      ; MINTERM D=A
    MOVE.L   #Destination_Address,BLTDPTH       ; DESTINATION
    MOVE.L   #Source_Address,BLTAPTH            ; SOURCE
    MOVE.W   #00,BLTDMOD                        ; DEST.MODULO
    MOVE.W   #00,BLTAMOD                        ; SOURCE MODULO
    MOVE.W   #%0000000000000000,BLTSIZE         ; SIZE & START
```

The register BLTSIZE must contain the width and height of the Blitter operation. Writing to this register will automatically start the Blitter, and should always be the last operation after all other Blitter registers have been set up. Although BLTSIZE is only a single, 16-bit register, it is split into two separate section that contain the height and width of the operation. The register is split as follows: hhhhhhhhhhwwwwww (h=height and w=width). The height value refers to single display lines, but the width value refers to words (16-bit values), therefore the maximum blit is 1024 lines by 1024 pixels (still pretty impressive though!). If this little tipette has whetted your appetite for all things hardware-hitting wise, then check out the Bible of Amiga programmers, 'The Hardware Reference Manual' from Addison Wesley. Alternatively, Abacus' 'Amiga System Programmer's Guide' is a worthy substitute.

JAMES RICHARDSON
HOOK, HANTS

CALL IT WHAT YOU WILL

In AmigaBASIC, you can give a window a name when it is first opened, but it cannot be changed unless it is closed and then re-opened. The case is even worse when you try to name a screen: with the current release of AmigaBASIC, you cannot even give it a name when it is first opened!

Fortunately, Intuition includes a routine which will handle this very nicely, thank you. This code will allow you to rename both the screen and current window title:

```
LIBRARY "intuition.library"

WinName$ = "blahblah"+CHR$(0)
ScrName$ = "BlooBloo"+CHR$(0)
CALL     SetWindowTitles(WIN-
DOW(7),        SADD(WinName$),
SADD(ScrName$))
```

MARTIN GORE
WARMINSTER, WILTSHIRE

WORKBENCH EXTRA

This month, for one month only, we bring you a special expansion to your Workbench section. **TONY MELLING** of Hyde in Cheshire writes on the subject of the CLI...

CLI CORNUCOPIA

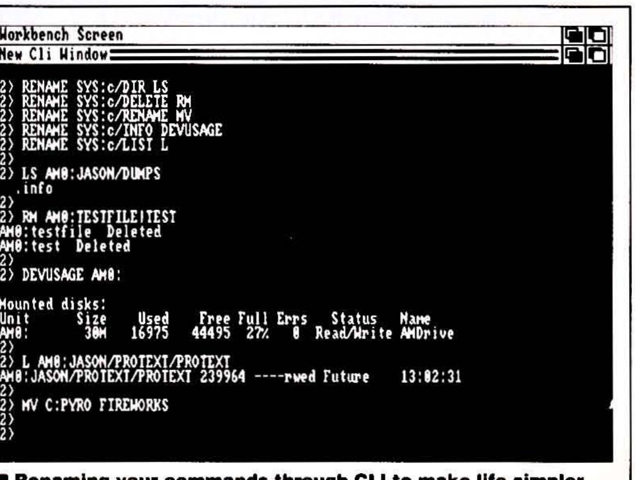
I don't know about you, but I just love dabbling about with the CLI. Consequently, I am always interested in CLI tips and wrinkles, and so, for all you dedicated CLI folk out there, here are a few ideas, some of which I hope will prove to of use to *Amiga Format* readers.

CLS FROM COMMAND FILE

Most of us will be familiar with the CTRL+L combination that clears the screen as a direct command, but a tricky situation develops if you need to execute a command file that requires, say for the sake of neatness, a blank window. This is one instance where good ol' AmigaDos lets you down, for no command exists that will produce the desired effect, at least not from a command file. But Hark! Is that the Cavalry I hear just over the hill? The following, if entered as the first line in the file, will rescue the situation:

```
ECHO "*ec"
```

A demonstration of this is shown by the next command file tip, over. ▶



■ **Renaming your commands through CLI to make life simpler.**

LABOUR SAVING DISCKCOPY

I protect my often used CLI disk (named QuickWb) with two backup disks, which after copying, I Relabel QuickWbCopy. The amount of keyboard input needed to effect the desired result became somewhat tiresome, and so I decided to let the Amiga do the darned job. Here's how: Load up ED with the command ED Ezecopy then create a command file with the following lines......

```
ECHO "*ec"
ECHO "ENTERING EZECOPY ROUTINE"
ECHO ""
CD DFO: System
DISKCOPY DFO: TO DF1:
ECHO ''"
ECHO :RELABELLING COPY"
ECHO ""
RELABEL DF1: "QuickWbCopy"
ECHO "*ec"
ECHO "EZECOPY ROUTINE FINISHED"
CD SYS:
```

Save the file be entering ESC followed by X: then to see the Amiga earning its corn, enter the direct command Execute Ezecopy. You can ignore a bug in the operating system that brings up a Requester saying "Insert <volume> in any drive." It will continue entirely of its own accord.

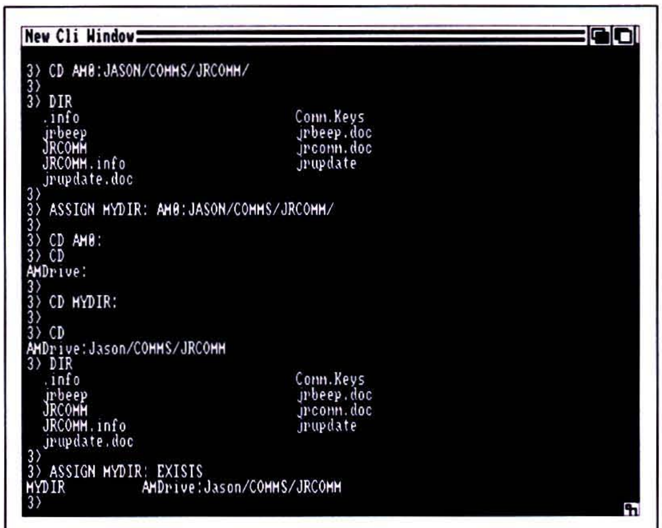
Obviously, you should change Line 9 to reflect the title of your own disk and drive status, and also, for single drive owners, Line 5 should be changed to read DISKCOPY DFO: TO DFO:

QUICKER CD

More often than not, after a bit of rummaging around in far-flung Directories, one needs to return to the Root Dir of DFO, which is normally achieved by the CD DFO: or CD SYS: commands. The command CD : does the same job and saves you three keystrokes!

THAT DARNED STARTUP-SEQUENCE

I guess that the most often-typed command line must surely be ED S/Startup-sequence: after all, we are always adding something new to that particular file. All you need to do to be forever rid of the chore is this: enter ED EDss which will load up the Editor. Input the following single line: ED SYS:s/startup-sequence then Save the file by ESC then X. On future occasions, providing you have followed the advice in the previous tip, you can enjoy the luxury of editing your much-used file by simply typing X Edss. Sheer bliss! (Well I think so.) Of course, following the example of the previous tip, you could easily Rename the file Startup-sequence "ss"; and then type ED S/ss, but if you happened to be in a non-Root Directory at the time, it just wouldn't work without firstly issuing a CD DFO: command or typing the line ED DFO:s/ss. Either way, X Edss is better.



■ **Continuing advice on the proper use of the Assign command in CLI is available below: see "My Kingdom for Assign".**

COMMAND SHORTCUTS

You can use the RENAME command to create an alias for any often-used command. Some typical examples of this follow here:

```
RENAME SYS:c/Execute X
RENAME SYS:c/Dir D
RENAME SYS:c/DELETE K (K:kill)
RENAME SYS:c/List L
RENAME SYS:c/Info I
```

After inputting the above, the commands in the C Directory will be saved in their new names, so inputting X Ezecopy would be the same as Execute Ezecopy. Likewise, K <filename> would Delete <filename>, and so on.

ASSIGN, ASSIGN, MY KINGDOM FOR A SIGN

The Assign command in the C Directory is often wrongly assumed to be only of use in those operations utilised by single-drive owners who shuffle their most-used C commands up into RAM, and then Assign C to RAM. In actual fact, the Assign function is an extremely versatile and powerful command, as the following example will illustrate.

Imagine a situation involving your most-used CLI disk, which for the sake of reference, we'll call Workdisk. On it you have a series of Directories concerned with the types and numbers of screws, nails, bolts etc, that you keep in old jam jars in your garden shed. These Directories are named: Screws, Bolts, Nails, Tacks, and are tested within the first Dir.

You find, for whatever reason, you are constantly accessing the Tacks Directory, either to Edit it, or peruse its contents, and your command line looks something like this:

```
ED Workdisk:Screws/Bolts/Nails/Tacks/Filename
```

A tedious tarra-diddle if ever I saw one. Enter stage left one knight in shining armour, the Assign command. Simply input the following line:

```
ASSIGN Tacks: Workdisk:screws/Bolts/Nails/Tacks
```

The transformation is now complete, and now access to the Tacks Directory is simplicity itself. To read a file named Littletacks in the Tacks Directory enter: Type Tacks:Littletacks.

The reason that the above works is because you have created a new Logical Device named Tacks. If you enter Assign <return> a list of all the Logical Devices recognised by AmigaDos will be listed, and on it will be details of the Tacks: Device. This ASSIGNment however is lost when the Amiga is switched off, or reset, but could be made permanent by including the instruction in the Startup-sequence file. To remove the newly ASSIGNed device without a reset, enter 'ASSIGN Tacks:'.

WORKBENCH 1.3 TRICKS

Three undocumented features exist in this update, all of which are quite useful. The first is a pseudo-command named CLEAR, which if entered normally from the keyboard simply clears the screen: but the word CLEAR can be used in a command file to produce a CLS, avoiding the use of the ECHO "*ec" set up. CLEAR is in fact an Alias for the following invloved line:

```
ECHO "*E[0;OH*E[J"
```

This is infinitely more fiddly than the method shown in my example which does the same job.

With the SHELL up and running, enter REVERSE to produce an instant window change to blue on white. Entering NORMAL changes you back again. As before, both commands are Aliases for ECHO strings, both of which can be used in Workbench 1.2 as follows: Enter ED Reverse to bring up the Editor; input the following line, and Save it with ESC then X

```
ECHO "*E[0;OH*E[41;30m*E[J"
```

Typing EXECUTE Reverse activates the effect. To utilise the NORMAL command, proceed as before but enter ED Normal and input:

```
ECHO "*E[0;OH*E[-0;31m*E[J"
```

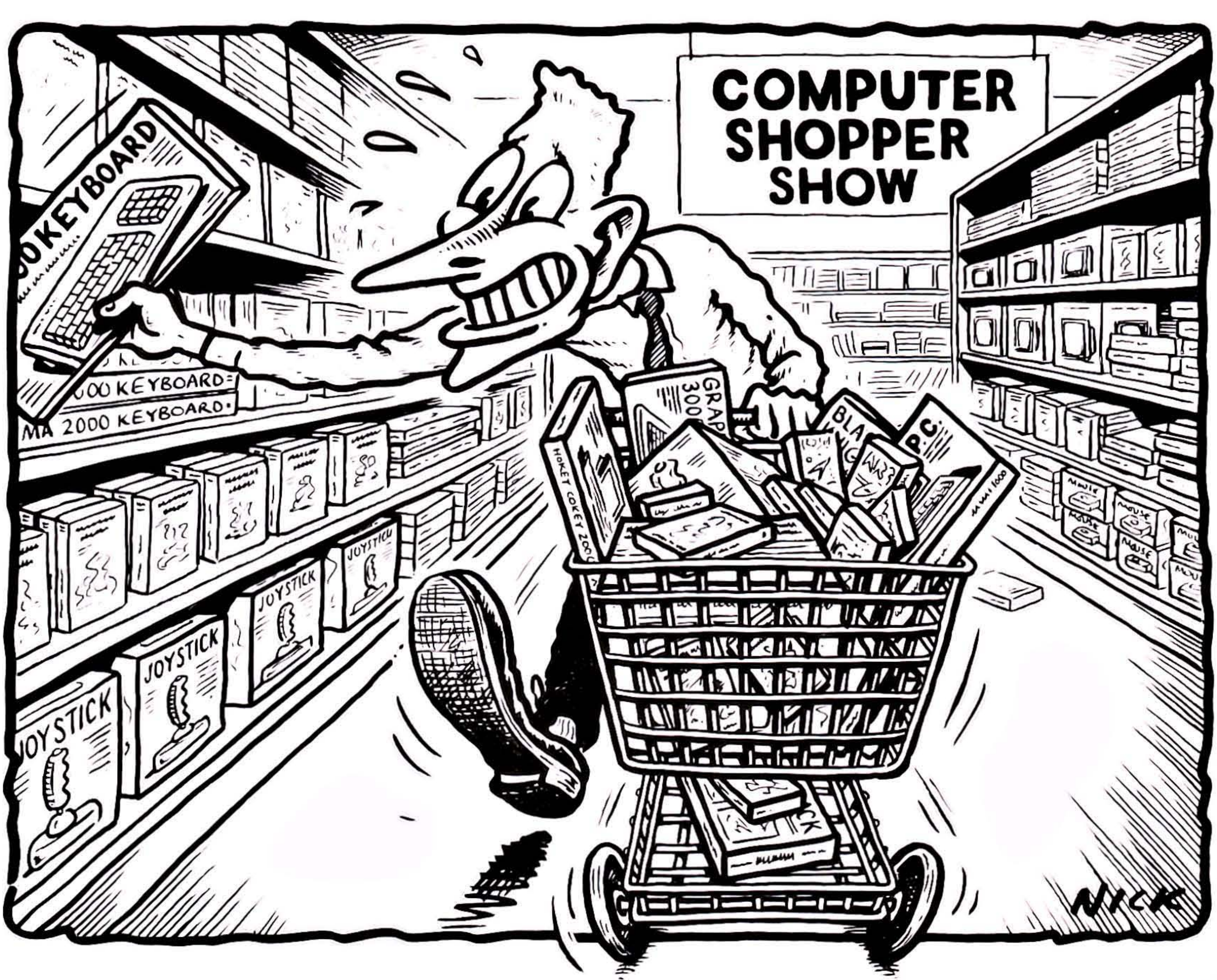
Type EXECUTE Normal to return to white on blue.

Well, that's all for now. I reckon Jimmy Greaves must have had the CLI in mind when he said "It's a funny old game, Saint!" ■

TAKE OUR MONEY!

Everyone knows what a complicated beast the Amiga can be at times, which makes a section such as Workbench a real life saver. If you have any cool little tips that you think would be of use to your fellow Amiga owners, then why not scribble them down and send them into Workbench – you could win yourself £50 for your troubles. This month's lucky tipster is Mark Pickford for his handy *Scribble!* tips.

Send your tips to: WORKBENCH, AMIGA FORMAT, 4 QUEEN STREET, BATH BA1 1EJ. £50 is waiting for you!



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The trolley run will take place at 9.30am on Friday November 24th in the Great Hall at Alexandra Palace – before the show opens at 10am. Each of the participating companies will have prizes out on their stand that the winner can grab and pile up in the trolley.

All you have to do to get this chance to go trolley crazy is demonstrate your acumen as a bargain hunter. Scan through the pages of this issue of *Amiga Format* and track down the best prices on the following list of products.

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The show takes place in the Great Hall at Alexandra Palace from November 24th-26th. As well as the stands offering bargain buys there will be attractions including a baby elephant, robotic Father Christmas, clowns, stiltwalkers, a strongman and buskers.

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GAMEBUSTERS

Another slice, ladles and jellyspoons, of hints, tips and anything else that'll help you get through to that last screen.



R-TYPE

SOME HINTS FOR PEOPLE WHO ARE STILL HAVING PROBLEMS WITH R-TYPE

LEVEL 1

Ensure that you shoot and capture the jewel that appears early on, as without it the level becomes very difficult. Send the force ahead of you into the machine to clear a path and keep it there as long as possible. When all the aliens are destroyed and the jewels captured, send the force into the revolving circle of rocks and join up with it at the last moment to avoid being destroyed.

When you emerge on the other side, use the laser to destroy the blue gun that walks along the bottom of the screen. Call the force back as the man with the gun approaches, and wait in the tunnel until he lifts off the floor. Providing you hit him enough times he'll be destroyed.

Repeat the procedure with the second man, remembering to collect the jewel that appears at the top of the screen: again this is of great importance.

To get the monster at the end of the level, wait in the middle of the screen with the force attached to the front of your ship, then send the force forward towards the blue head in the middle and move upwards a little. This should do the trick all right.

LEVEL 2

This level is simply about avoiding aliens and collecting all the jewels that appear. To destroy the monster at the end, bring the ship on, with the force attached to the front, almost to rest on the blue eye that appears from time to time. When you've hit it enough times, it'll be destroyed.

LEVEL 3

This is one of the hardest. Collect all the jewels, otherwise things get really hard. Try to destroy all the guns on the bottom and right hand side of the ship alternating the force in front or behind the ship where necessary. Although this is quite difficult to master, it can be done. To destroy the ship, aim the laser at the yellow and orange gun base. When the gun is destroyed, the laser will be reflected off the base and into the heart of the engine.

LEVEL 4

This is probably the most fast and furious of all the levels. Again, it is about getting the force in the right place at the right time and keeping an escape route clear. Beware the aliens that cross the screen at speed; they'll catch you out if you don't remember when and where they appear. To destroy the ship at the end of the level, shoot the semi-circular orbs that appear on it from time to time. The ship will then split up into three sections, and as before, enough fire-power will destroy it.

LEVEL 5

The toughest bit of this level is remembering where the yellow snakes come onto the screen; shoot the other aliens, but avoid blasting the yellow snakes, as they split up and just make life more difficult. The other thing to avoid here is the brown fossil-like alien which homes in on you regardless. Collect all the jewels. To destroy the monster on this level much more quickly, keep the force in its centre.

LEVEL 6

There isn't a monster at the end of this level, although some serious manoeuvering is required to

IN BRIEF

FALCON

If you should find yourself running low on ammo, press control and X during the game, and watch those extra 500 cannon rounds and 9 extra sidewinders clock up on the instruments.

LEONARDO

The codes for...
Level 10= EMMENTALER
Level 20= ALPHORN
Level 30= MATTERHORN

KEITH MAY, ESSEX

ROBOCOP

For infinite shields simply pause the game and type in BEST KEPT SECRET (including spaces).

MATTHEW & PETER WARNER
BASILDON

HAWKEYE

Having survival problems? Press "DEL" while playing the game and when you've lost all your lives, you'll find you jump to the next level instead of dying.

destroy all the aliens. You can safely avoid the large ships that roam around, but don't ignore the brown aliens around the edges of the screen; they shoot with remarkable accuracy at the most inopportune moments. Destroy as many of these as possible. At the end of the level, position yourself at the bottom of the last rectangle on the left hand side, and follow the aliens that enter the rectangle, otherwise you'll be trapped.

LEVEL 7

Again, there's no monster at the end of this level. Get to the bottom of the screen as quickly as possible, and collect the jewels as they appear. Then move to the middle of the screen, where you have the best chance of survival. At the end of the level, avoid the monsters where possible, shoot the rest of them, and proceed to the next level.

LEVEL 8

Avoid the green aliens and the grey stars that shoot around the screen. Collect the jewels (for a change!) and shoot the middle of the monster a lot...

MARK PICKFORD,
BROOMFIELD, KENT

KULT

THE COMPLETE SOLUTION!

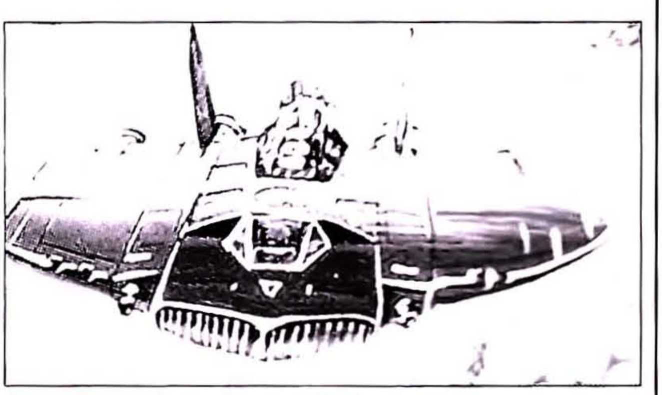
Go to The Noose, use Solar Eyes, jump on the left rope, push lever, push eye (under the lever), pass through trap door. Go forward, go forward again, go through left passage, go forward, go forward again. When told 'Don't move', click on 'accept'. When asked 'Why are you in this mountain of madness' click on 'tell truth'. Use zone scan, lift stone slab, take flask, go through left passage, go forward, go through trap door, go through door into passage, go through passage, go to Saura's repose.

Go to In the Presence of God. Go to Placating the Powers, when challenged by first woman, click 'attack'. When challenged by the second woman, click 'PSI powers' then click 'brainwarp' then click 'give flask to drink'. Pick up sacrificial blade, click 'PSI powers, then 'zone scan'. Push lever. Go back through In the Presence of God, Saura's Repose, Passage and into Refectory. Click 'PSI powers' then 'Sticky Fingers' to get through trap door. Go forward, go forward (you should now be in the cavern with Ash and Norma Jean), go right, go forward, go right, go forward, go through trap door, click 'PSI powers' then 'solar eyes'.

Go to The Master's Orbit (there shouldn't be anybody about), and into The Master's Eye, inspect the Master of Ordeals, search him, take the whistle and whistle with it. Look into the deep cavity, take egg, go out, go through passage and into ring, go through passage in outer wall, go left, go left, pull bolt, pass through bars, use 'sticky fingers' to go through tunnel at top of screen, go up, go through In the Presence of God and into the Threshold of Truth.

Attack woman, put the egg into the opened mouth on the statue. Inspect the lectern, use PSI-shift to get the statuette from the top left of the screen. Go through the passage, go through In the Prescence of God and into Saura's

GEMINI WING



Just before you're about to be killed for the 4th time, press the left mouse button, to bring up 2nd player, and keep pressing the fire button until you're killed; you'll then re-appear at the bottom of the screen.

EDWARD MARRIOTT
WEST YORKSHIRE

BATMAN

Move right, pick up the disk and carry on right to the end of the corridor. Go down through the door, continue right and collect the key and badge. Move left 'til you get to the spanner, pick it up, use it and them drop it. Continue left and collect the grenade, then go right and up through the door. Go right until you reach the room captioned 'Insert the disk' and use the disk. Go up through the door and leave the cave.

Move right until you get to the ladder and climb it, collect the banana which you can eat when your energy is low to restore it all.

Return to street level and go right (show the badge to the policeman and continue right) to collect the Batrope. If you hit the Penguin's men with your Batarang eight times they will drop a packet of crisps which you can eat to increase your energy.

Go left and collect the sweet (this, like the banana, restores all your energy). Carry on left and climb the ladder, move right 'til you get to the torch, pick it up and go back right 'til you get to the ladder. Return to street level and go right, collect the trainers and carry on to the warehouse ladder. Climb the ladder and go right till you get to the door, use the key and drop it then enter the warehouse. Go left to the end of the corridor and through the door, pick up the magnet and go right and up through the door, go right and then enter through the door. Move right until you get to the room called 'Shadows everywhere' and go through the door. Go left and collect the bread, then right till you reach the dead end. Use the grenade to blast the wall and go up through the door. Go right and up through the door, carry on to the end of the corridor and through the door. Continue right till you get to the room called 'Getting you down' and use the Batrope. Walk left and collect the lift key, now use the trainers.

Move right and up through the door, go right and then down through the door. Go left and down through the door and use the torch. Go right, up through the door and left, collect the dart and go back to the place where you landed when you dropped in on the Batrope and use the lift key on the lift, drop the key and go through the door and along the corridor until you reach the room called 'Shadows everywhere'.

Go through the door and left and throw the dart at the dartboard and pick up the passcard. Leave the warehouse and go right and return to street level.

Go right and stop at the screen called 'Clue: pass it on' and use the passcard to enter. Go left and up through the door, collect the key and leave the room, go right and up through the second door, then go left and through the door. Go left and up the stairs then right to the end of the corridor and through the door, pick up the tape and then go left and through the door. Now go right and through the door using the key. Pick up the disk and go down through the door, head right and through the door, carry on right and collect the trumpet then go left and put the virus disk in the Penguin's computer. His plan has failed and you'll have won!

DANIEL SARGENT
LONDON

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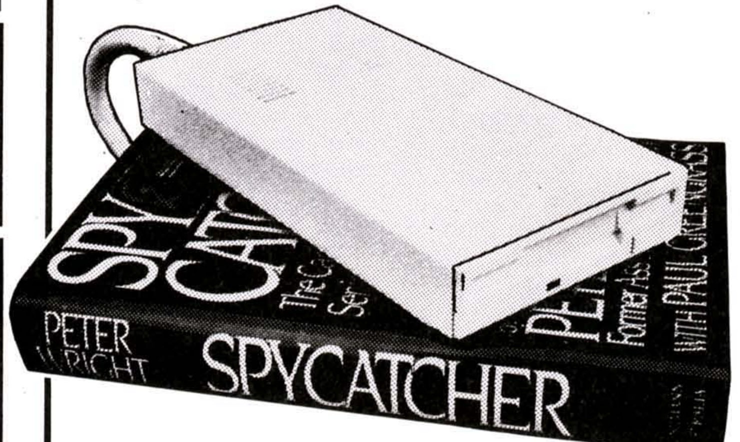
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Repose. Put statuette in niche, put monkey into 'the tunnel', go to In the Presence of God, zone scan, go into passage, push lever. When challenged by Zorq, click 'PSI powers' then click 'extreme violence', click 'PSI powers' then 'brainwarp' then click on Harssk, use PSI-shift to close the trap door NOT the lever, click 'wait', click 'possessions', click 'sacrificial blade', click 'throw' and click on Harssk – now watch and read.

TOBY GADSBEY
STAFFORD

DEMON'S WINTER

And here, ladies and gentlemen, we have a hack for the new SSI game; this little proggy allows you to examine all the text files in the program, which should make solving those oh-so difficult puzzles and problems a little bit easier.

For single-drive users
1. Enter AmigaDOS (CLI) via the CLI icon in the system drawer from workbench.
2. Type COPY DEMON:DEM_DATA/#?.TXT RAM : (You will be asked to change disks. Insert the game disk; backup!)
3. When the copying has finished, re-insert your Workbench disk and enter the following:

    COPY C/CD RAM:
    COPY C/TYPE RAM:
    CD RAM:

4. Enter TYPE name where name is any one of the following files;

    data1.txt
    data2.txt
    data3.txt
    data4.txt
    data5.txt
    eregore.txt
    t.txt
    t2c.txt
    t2d.txt
    town.txt
    win.txt

And for double-drive users;
1. Enter AmigaDOS, as before. Put game disk in df1:
2. TYPE DEMON:DEM_DATA/name

Easy, huh? As well as this, all the pic files in the dem_data directory can be viewed using the VILBM utility on any of the old coverdisks.

And if that wasn't enough, here's some tips, still for *Demon's Winter*...
1. Use the icicle to open the doors in the Ice Temple.
2. The God Ancient can still be worshipped after the other gods have vanished.
3. If you're stuck on a mysterious island with a map room, bell tower, and a closed portcullis, then try going outside, following the edge of the mountains all the way round until you come to a hut with an old woman. Sleep there. Ring the bell in the watchtower before sunrise and the portcullis opens.
4. The jewel-encrusted "Xeres" sword given to you by a hobgoblin-blacksmith is very heavily cursed, so it's wiser not to try and equip it.
5. Follow the road from Ynoth to enter the dungeons containing Brolor.
6. Don't bother learning POTION or ITEM lore. After playing the game for a month I haven't used them.
7. Summoned Elementals can cast unbinding spells.

NICK 'BENAUD' FISHER
CORNWALL

TVS FOOTBALL

Here we go, here we go... oops, wrong sort of football! Anyway, here's the way to make a mega-team in TV Sports Football;

	POSITION R.K	SPEED	STRENGTH	HANDS	ABILITY	TOTAL
Q.B	6	5	5	3	6	19
LHB	2	7	1	8	7	23
RHB	3	7	1	7	7	22
F.B	11	4	1	8	1	14
LWR	13	1	1	8	2	12
RWR	12	3	1	8	1	13
LILB	1	6	6	6	6	24
RILB	5	7	1	7	5	20
LOLB	17	5	1	1	1	8
ROLB	18	4	1	1	1	7
LC	7	7	3	2	6	18
RC	4	7	7	2	5	21
LS	8	5	1	8	1	17
RS	10	6	2	1	6	15
PUNTER	9	6	6	2	2	16
KICKER	14	3	3	2	2	11

OFF LINE (r.k.)15 (total)10 DEF LINE (r.k.)16 (total)9

When playing with this team...
1) When throwing a short pass, throw it to one of the halfbacks; as they're fast, they stand a good chance of gaining extra yards.
2) When rushing, also favour the halfbacks.
3) Always use either 4-3 or 6-1
4) Pick Run Outside and use the LILB to stop the pass.

SHANIL MONTRI
BEDFORDSHIRE

£150! £150! £150!

Be a part of the *Amiga Format* Game Busters give-away! All you have to do is send in your maps, tips and pokes to: Game Busters, *Amiga Format*, 4, Queen St, Bath, Avon. BA1 1EJ. This month's winners are: Toby Gadsbey, Mark Pickford and Fanikh Malik. Well done

KING'S QUEST III

Fish bone powder, Mandrake root powder, Nightshade juice, Saffron, Toadspittle, Toadstool powder are on the shelf in the wizard's laboratory.
Acorns are in the big oak tree on the edge of the desert.
Amber stone is given to you when you visit the oracle.
Bowl is on the shelf in the kitchen.
Brass key is on top of the cupboard in the wizard's bedroom.
Bread is on the table in the kitchen.
Cactus is in the desert.
Cat hair; grab the cat, then take the hair.
Chicken feather; grab the chicken then take the feather.
Cup is on a table in the dining room.
Dew is in the garden of the three bears.
Dog hair; take the hair off the dog in the shop.
Eagle feather can be picked up as the eagle flying about drops it.
Fish oil can be bought from the shop.
Fruit is on the table in the kitchen.
Knife is in the kitchen on the cutlery rack.
Lard can be bought from the shop.
Magic map is in the wizard's bedroom behind the clothes in the cupboard.
Wand is in the wizard's study, in the cabinet which can be opened with the brass key (see above).
Mirror is in the cabinet next to the bed in the wizard's bedroom.
Mistletoe is on the tree west of the three bears house.
Money can be found in the bandit's hideout.
Mutton is on the kitchen table.
Porridge is on the table in the three bears house.
Pouch can be bought from the shop.
Shovel can be bought from the shop.
Snakeskin is in the desert.
Spoon is in the kitchen, in the cutlery rack.
Mud is on the bank of the river that flows through Llewder.
Thimble is upstairs in the three bears house.

And a brief guide to making spells;
First you must gather all the ingredients that you can find outside the lab, that you need for the spell. Then get the brass key and use it to get the wand from the study. Go over to the bookshelf. You will notice an irregularity in the floor pattern where there is a trap-door. Position yourself between the trap door and the bookshelf and "move book" then "pull lever"; the trap door will open. Go down into the wizard's lab.

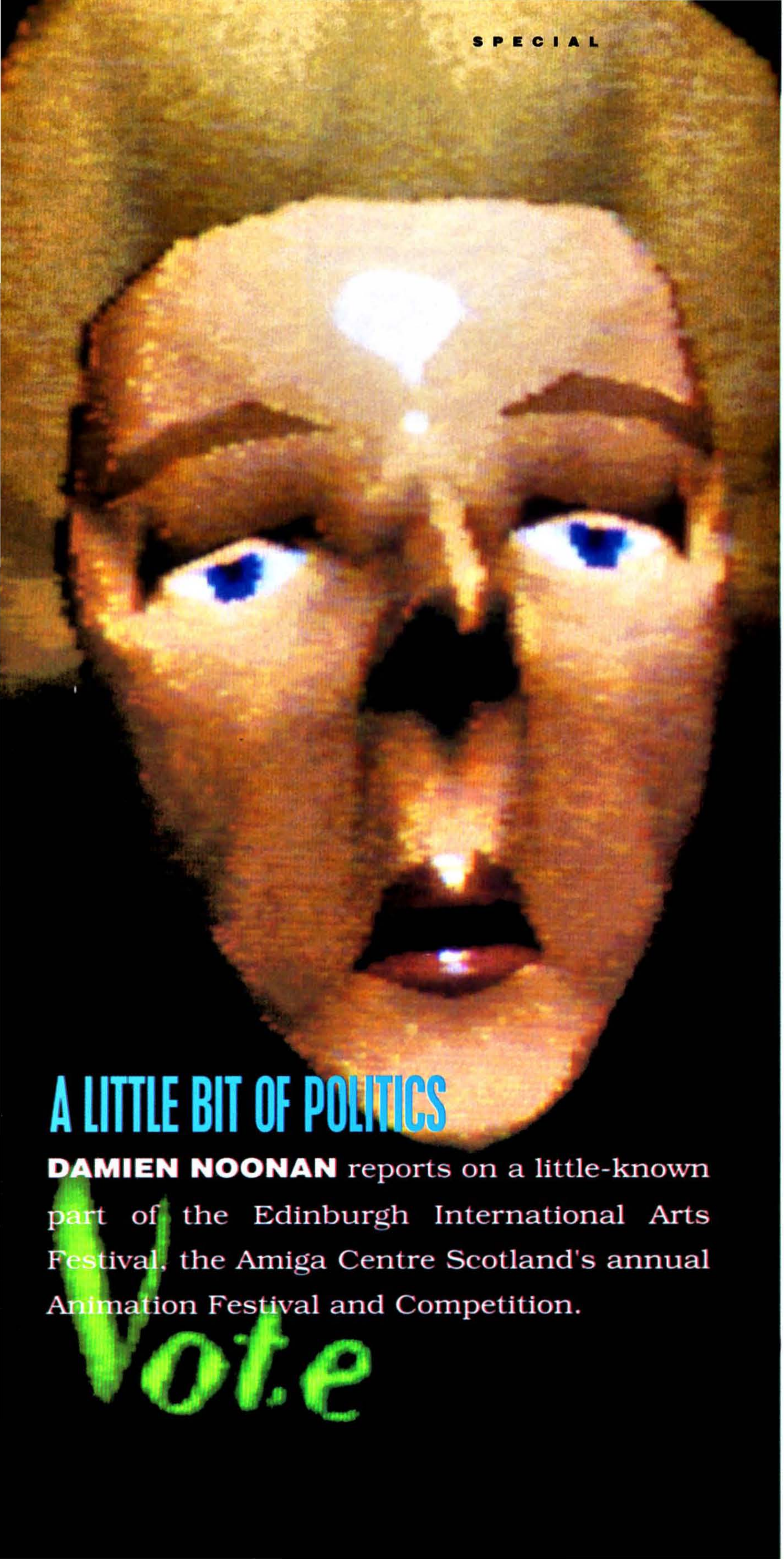
There, take the remaining ingredients needed for your spell from the shelf. Then, go over to the book "Sorcery of Old". You have to open the book at the right page; pages are indicated by a roman numeral at the bottom. For instance, for the "flying like an eagle or a fly" spell, enter "open book at page iv". Type in what it says in the book, word for word (except for the stuff in brackets), otherwise you'll die.

It's a good idea to save the game before doing a spell, just in case you make a mistake. Once the spell is made, leave the lab, closing the trap-door behind you. Replace the wand, and hide the brass key under the bed in your room, as it is a magical item (the key, not the bed!) and the wizard will kill you if he finds you in posession of it.

FANIKH R. MALIK
LONDON SW1

NEED AN OBJECT AND DON'T KNOW WHERE TO FIND IT? READ ON...


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A LITTLE BIT OF POLITICS

DAMIEN NOONAN reports on a little-known part of the Edinburgh International Arts Festival, the Amiga Centre Scotland's annual Animation Festival and Competition.

The first day of September, 1989, and the famous international arts festival in Edinburgh is reaching its grand finale. Up at the castle, the military pomp and circumstance of the tattoo is in full swing; down in the streets, the young and occasionally talented are entertaining each other, vying to be recognised as this year's rising star. Meanwhile, in a back lane behind a tall row of grey stone houses, a new artform is enjoying its own role in the festival: the art of computer animation as practised on the Commodore Amiga.

This is the second year in which Martin Lowe of the Amiga Centre Scotland has tried to bring hi-tech art to the attention of the festival-going public. For three weeks his shop is transformed into an exhibition room, as many Amigas as he can lay his hands on ranged around the walls. The most famous and impressive animations on the Amiga scene – the Walker demo, ray-traced Newton's cradle and the jumping Angle-poise lamps – run all day, entertaining curious visitors. There are even workshops to give complete novices a basic grounding in the use of an animated paint package. And all this is provided free of charge by the Amiga Centre staff.

Climax of the event is the judging of prize winners in the ►



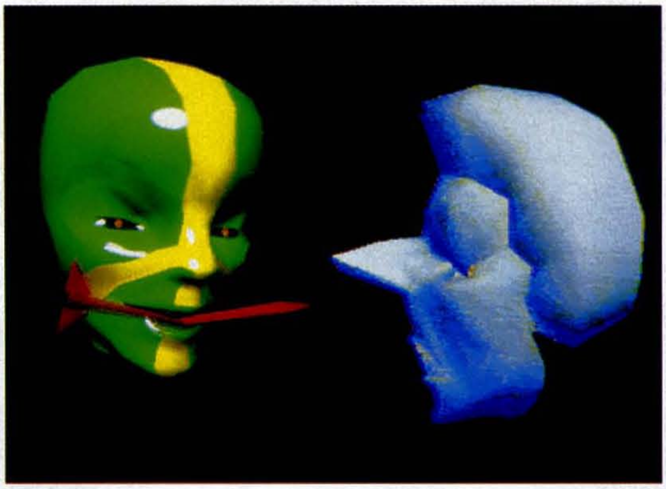
■ Maggie in her guise as the angelic heroine of green voters.



■ And in her true colours: ready to stop the threat of greenness.

Amiga Centre's annual animation competition. Entrants include many professionals, but even more amateurs who spend hours over complex ray-tracings in their own time and their own homes. Entries, on floppy disk or video-tape, vary from short simple sequences to entire video productions, compiled from many sections created with many different paint packages and edited with professional video gear.

The quality, however, varies less than the subject matter. Most of the entries were extremely cohesive and well presented: but their concerns ranged from a smidgeon of sex, to heaps of violence and a little bit of politics.



■ **The real spirit of green politics manifests itself in the form of a force for disarmament: Maggie is momentarily taken aback.**

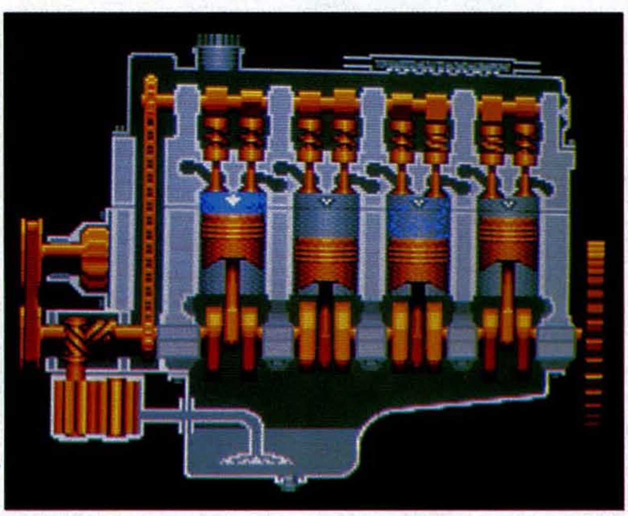
Suicide and Incest

Shock-effect tactics made the video-tape entry from American demo programers Process one of the least forgettable attempts. A series of quite remarkable animation sequences, with resonant sexual and political overtones, built up into a bizarre kind of narrative, climaxing with a disturbing but very well made sequence in which a baby knocks a hand-gun from a drawer and blows its head off accidentally. Unfortunately this was then capped with controversial live footage from an American newscast in which a businessman is seen committing suicide with a gun in his mouth. A bit strong, very sickening, and quite unnecessary: so despite the quality of the animation, Process came away without a prize.

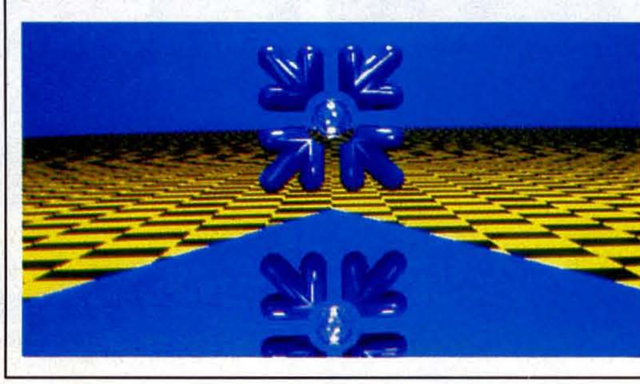
Another powerful and memorable entry was a good deal more subtle. This video-tape entry, from Amsterdam-based animator Greg Lawson, was commissioned by the Dutch government as part of an educational film about incest. "Incest" was very reminiscent of Raymond Brigg's work, treating a serious subject through the beautiful, understated and colourful style of a children's book. The pastel and watercolour-like illustrations were lovely, and the underlying message was subtle: but Greg failed to win a major prize, possibly because his techniques were a shade too traditional.



■ **The concluding frame shows Maggie Regina royally minted.**



■ **(Above) Fourth-place prize-winner, "Engine" from John Armstrong, a fine cutaway animation of a car engine. (Below) The animated bank, third-place winner from Dileep Sharmar.**



In Reverse Order...

So what about the prize winners? Well, many were granted prizes, five received commendations, but the main honours went to the top four. The judges, all experienced in professional broadcast animation and computer graphics, were Jack Garrow of video production outfit Inverdeal Productions, Nick Masters, deputy editor of TV Production International, and Len Brown, lecturer in computer graphics at Middlesex Polytechnic. They chose the following four winners, in the traditional reverse order....

In fourth place came "Engine" by John Armstrong. This was a technical-drawing style cut away of a car engine, demonstrating the inner workings of internal combustion. As the pistons moved up and down the chambers, the valves opened and closed to show the intake-compression-combustion-exhaust cycle, and the crank drove the cam-shaft and so the cam and the valves. The animation was smooth, clean and elegantly drawn, on an expanded 1Mb A500 with *DPaint III*.

Third prize winner was Dileep Sharmar, with a combined effort involving another engine illustration, not shown on the day of judging, and a *SA3D* animation of the Royal Bank of Scotland logo, flying into and out of the screen above a mirrored and chequered landscape. Smooth, fast and very impressive indeed.

Second prize was a surprise choice but a popular one, awarded to nine-year-old Jonathan Grant for his endearing collection of animated mouse pointers. Smartly presented, each with an icon to start, and amusing, they changed from a 'smiley' face that grinned and grimaced to a whizzing clock, to a small chap pedalling furiously away on a bicycle. Good clean fun.

And finally, the great honour of first place, ladies and gentlemen, went to Mark Wirt, an amateur working at home with a 1Mb A500 and second drive. "Maggie goes Green" was very like Ben Elton in its content: a little bit of politics, a small amount of humour, and huge quantities of animation.

It shows the Iron Lady herself, snapping up the green vote, until confronted by the spirit of green disarmament: at which point she turns into a horned devil and spits fire in the face of her foe. The sequence concludes with her face appearing instead of the Queen's on a pound coin (known up here north of the border as the "Brass Maggie"). A combination of political comment and humour, but above all, beautifully executed. The frames of animation, rendered with *SA3D* and *Digipaint 3*, numbered a full 170. The end result was a worthy winner, even though Mark had said before the judging: "I won't be winning this year – although I"ll go down fighting – the subject matter will be popular in Scotland anyway."

All in all, the animation competition was a great success. So was the Amiga Centre's animation festival, within its current limitations, but it deserves better. With more facilities, wider recognition and publicity and a bit of financial support it could become a massive, original and educative part of the Edinburgh Festival arts scene.

As it is, even those who stand to gain most (financially at least), can't be persuaded to offer Martin Lowe some support. With appropriate backing from a certain well-known international computer firm, anything would be possible for the animation festival. A little bit of politics... thank you, goodnight. ■

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Acorn, Apricot, Amstrad PC, Atari, Cambridge, Samsung (Sorry; no Sinclair) & those funny grey things which are supposed to have a "massive" 64k RAM & whose Basic was probably written by Authur Mullarde.

★ **AND** ★

We discount every-thing, and follow customers instuctions to the letter (like the one who recently asked (anonomously) for his parcel to be marked "KEEP YOUR GODDAM HANDS OFFA MY JOYSTICK SWEET-HEART") Hello Brian.

★ **AND** ★

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★ **AND** ★ (I'm getting tired)

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Loads an loads ov uvvers (but only if they're good enough) (Take a look at COMPILATION OF EXCELLENCE by Ocean). Well, that's it for another Month. I just want to say thank you to all of the people who helped keep me out of "Debtors Court". Hello Mr & Mrs Holland of Shifnal & Karl with a 6128 & Kazawacky 1100 (for sale folks), who lives in Erdington, Birmingham & my Mum to mention but a few. (More next Month People). Finally: We have proven that A&A's business style works. So thanks for the compliments, you know where we are, and gimmiyaorda. P.S; THE FIRST 6 PEOPLE (PLACING AN ORDER) WHO CAN TELL ME WHAT HALF A BYTE IS CALLED WILL RECIEVE A FREE GAME. Clue; BEGINS WITH N, ENDS WITH E & HAS BB IN THE MIDDLE. Tiebreaker; Which Computers did ATARI recently buy in order to develop quality software? Clue; 5 letters, begins & ends with "A".

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FORMAT LETTERS

Yet again, a few of your many letters manage to escape the Origami treatment. All new offerings are welcomed by **BOB WADE** at 4 Queen Street, Bath, BA1 1 EJ. Write now!

PRIZE WINNER

ICON HEISTER

Scene: A dimly lit room on Manhattan's east side.

"Ok you guys dis' is the way it's gonna be. Icons... Icons, dats where da money is."

"Ere whata' ya' mean boss...?"

"Hey listen Bugs, ya' dumb luuker, don't ya' see it: all we have to do is to steal all da' disks in all da' world, an' sells dem' back to the dumb clucks who owned dem' in the first place...but we gonna needs a distributor....."

"Does dis' means we gonna buy a car boss...?"

"Bugs, you carry on likes dis' an' you gonna end up as an Atari salesman...!!!"

"Now listen closely Bugs, the scam it works likes dis', first we gives everybody a copy of *Icon Meister*, we can use *Amiga Format* as de' distributor – they've been running dis'(k) racket for years – den' they sits at home making der' new icons, den' whens they come to saves dem' dat's whens we makes the snatch... dis' could be de' greatest heist of all time...!!!"

"Aint' people gonna ask questions Boss....?"

"OK, so we'll use Mr Bob Patsy Wade, he's da' best gobbledygook man in da' dusiness".

"Now listen up Bugs dis' time next month we'll put out de' correct *Icon Heister*, er, I means *Icon Meister*, program an' charge 2.95 sterling english to gets der' icons back, an' I'll tell yer' what Bugs I'll even throw in a glossy magazine...."

"Yer all heart Boss.....!"

(Boss fingers lapels). "...Yeah."

PAUL TAYLOR
. STALYBRIDGE, TAMESIDE

Proficient though I am at gobbledygook, wibbling and waffling I found this excruciatingly hard to translate. Are you suggesting Icon Meister *did not work quite as it should? If so, check out the Workbench pages for news on the correction of a minor bugette.*

If you feel like sending the boys round, here's a warning – I know what you're thinking. Did he fire five staff writers or six? Well, to tell you the truth, I'm not sure, but seeing as this is Amiga Format, *the most powerful magazine in the world, and could blow your disk drives clean off, you've got to ask yourself a question: do I feel lucky? Well, do ya, punk?*

THE ULTIMATE AMIGA

I enjoyed very much your Dream Machine article in the September issue in search of the ultimate Amiga, I thought I had to give my views on what the Amiga should look like in the next decade.

The following machine I believe should be a replacement for the A500, or as an intermediate model between new versions of the A500 and A2000.

The Ultimate Amiga

- Separate keyboard and a small sized CPU casing instead of the bulky A500 case.
- A more reliable mouse with three buttons and micro-switches.
- The ability to plug in a 14" paper white LCD screen as a second monitor for serious applications. Together with built in TV modulator.
- Two Megabytes of Chip memory, expandable to four Megabytes internally and a further 12 Megabytes externally.
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- An improved AmigaDos on ROM and a battery backed up clock.
- Improved custom sound chip with eight channel stereo sound and better speech synthesis.
- A custom chip designed specifically to handle 3D graphics.
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• Built in MIDI interfaces, to keep the musicians happy.
• Two parallel interfaces to allow for additional peripherals.
• Two expansion buses, to increase expansion of the base machine.
• Three joystick ports, so that two joysticks can be plugged in at the same time as the mouse.
• Two dual format 3.5" disk drives that accept both normal double sided and high density disks.
• Optional high capacity 5.25" floppy drive, such as the Qume Hyperflex drive for the PC, having a 20 Meg capacity for each disk. The speed and capacity of such a drive could eliminate the need for a hard disk or even 3.5" floppies.

MH LEWIS
PORT TALBOT

VIRUS FREE, TROUBLE FREE?

After the routine monthly faffing about copying the Amiga programs from *ST/Amiga Format* disks, what a nice change to have the first offering from *Amiga Format*. No more running *Diskdoctor*, trying to convince the infernal machine that it wasn't "bad" and that it was a DOS disk.

But what happens? Somebody has to try to be clever and can't leave well alone. Booting up with September's disk to see what the game demo was like, up pops this message telling me "This disk is virus free". Fine! Nice to be reassured. However, when I inserted the disk under Workbench (with *VirusX 3.10* in the background) *VirusX* leapt into action to warn me that there was something iffy about the boot sector. What to do? Was this all an elaborate trick? After all, I had never seen *VirusX* operate in anger before.

I deduced that it was the "virus free" message that was upsetting things, so I let *VirusX* savage it. Then the Amiga complained that it wasn't a DOS disk, just like the old days!

How about sticking to a nice, boring DOS disk format with no gimmicks and leave out the virus scares...PLEASE?

ROGER WEST
BOURNEMOUTH

You had deduced correctly that it was the 'virus free' message causing VirusX *to protest. Basically, viruses hide in the bootblock of a disk: but so long as Jason's 'virus free' message is there, a virus can't be. Of course,* VirusX *will recognise the message as a non-standard bootblock. Just ignore the thing and copy the files as per normal: you won't need* Diskdoctor *or anything else. Remember, you can safely ignore* VirusX *as long as the 'virus free' message appears when booting the Coverdisk. BUT note that since some readers found it a shade confusing, we've returned to a standard DOS bootblock for this issue's disk, to let the idea sink in.*

BACK TO BAK

Does anyone remember the Steve Bak interview in Issue 8 of *ST/Amiga Format* (Feb 1989)? There was a small bit on Page 16 saying "Bak predicts: Sometime this year at least one publisher will launch a range of 16-bit games, priced at £2.99. Laugh if you like, but watch the news." So where are they?

TIMO NEWTON-SYMS
CHALFONT ST GILES, BUCKS

Beats me. I guess Steve's crystal ball was a bit misty that day – maybe it said £299. Then again, take a glance at the price of Infection *on Page 53 of this very issue: it's a step in the right direction, after all...*



PRIZE WINNER

SHRIVELLING GAMES

The computer games market seems to be drying up, as it were. Film tie-ins, coin-op conversions, tiring adventure games and old games with slight modifications seem to dominate the shelves of many computer stores. Old and worn themes still appear in even the newest releases. OK, I admit there have been some superb games but their lastibility soon dies over the years, as yet there is no game that has futurity in mind.

Simulations also suffer some series problems. The accompanying bumf takes too long to read, there is no real sense of purpose in these games and it usually results in even the keenest player simply giving up, because it has taken them so long to get into the game. The old adage "too many cooks spoil the broth" could not be truer when it comes to the games market.

Here is a question for your readers. Define the ideal computer game? For me a computer game should be informative, ie provide the player with the necessary principles of the game, eg background and games controls. Games should demand brainpower as well as "lightning reflexes". The game should be a challenge for the player not an endurance. Most important of all the player must be able to relate to the game, by the game using its sound, graphics and general playability, place the player in the correct atmosphere allowing the player to get a feel for the game – after all the more comfortable you are the better you perform.

Why do computer industries provide those black plastic cassette cases in their packaging when the games are on disk?

In essence what this letter is about is that I feel that computer games are suffering because software houses pay too much attention to their advertising hype rather than to the actual products they are trying to sell. How many games do you know that have suffered in this way?

Isn't it about time all those top programmers produced the ultimate game of life? Yes, that's right, a game that simulates life from the cradle to the grave. Imagine our day by day actions on a computer placed in an environment so true to life. This would give the user the chance to live their lives before they have in reality. I don't think people mind paying large amounts of money, not if they directly benefit from it.

TARIQ ASLAM
EDINBURGH, SCOTLAND

On the whole I agree with you: the standard of gameplay has not developed much in the past five years. There are always the notable exceptions to the rule, but the general standard has hardly improved. I don't think your final idea is the right way to go though: total life simulation sounds awful to me, I like a bit of escapism.

Introducing game elements into real life is far more attractive: smart bombs for use on the M25; Prince Charles using earthquaking from Populous *to destroy his least favourite buildings; teleporting so as to avoid having to travel by British Rail; viewing your jet fighter from the outside while flying it; and most importantly of all, a pause mode so you can stop life for a break occasionally.*

SARCASTIC, ME? NOOOOOOOO!

I'd like an Amiga with a 90%-plus finished Workbench and OS. One that doesn't crash on me every ten minutes. Yes, I know the perfect machine was supposed to be within the bounds of feasibility but we can all dream can't we.

My ideal Amiga would provide an operating environment that was bug-free and memory efficient. It wouldn't casually swallow huge chunks of RAM for itself, nor would it innocently yield a few hundred

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K to every puny little program that happened along, without claiming it back afterwards. In fact Commodore wouldn't be stupid enough to supply it with a pathetic 512K in the first place, and then expect the user to buy their expensive upgrade. 1Mb as standard would be the order of the day.

Finally, the Guru "Software Failure" error message would simply not exist. (Just what the hell is a "Software Failure" anyway, and why is it so common?)

This wonderful concept came to me after spending a few days programming in BASIC on my A500 (or "vicious bastard" as it has become known to me). A few simple file copies and the use of the 'Scroll' command caused the amount of available 'flush libs' or 'Clear' would restore it to its previous reading. Eventually continued use produced an "Out of Heap" error, and the only solution was to re-load Workbench. I accept that such tasks require memory, but I would prefer that it could be reclaimed when finished with.

The thought of Workbench 1.4, demanding further memory loss and with a fresh set of bugs, makes me sweat at night.

ADRIAN RIXON
WARRINGTON, CHESHIRE

PS My program is no longer eating memory because a few days ago my Amiga wiped it off the disk, under the pretence of SAVEing an updated version. I hate it.

Listen luvvie, I know your relationship is going through a bad patch at the moment, but the key is communication. You've got to start talking and understanding each other's problems. When was the last time you polished her keyboard or bought a new interface? At this rate she may leave you for a new owner.

WRONG WAY GREY

Congratulations on your first two issues of *Amiga Format*. My interest in the Amiga coincided with Issue One and I found the magazine valuable in helping me to come to a buying decision.

I eventually bought a B2000 Revision 6 1-meg machine imported from Germany. I reasoned that if the Germans could build BMWs then they ought to be able to produce a decent Amiga... and it was £100 cheaper than buying a UK machine. This would no doubt be regarded as a 'grey' import by Commodore UK. However, it does accept 240 volts at 50Hz and seems very nicely put together. The supplier gave a fair written replacement guarantee and it was delivered by courier. The second drive, df1, turned up two days later in a jiffy bag – no fitting instructions but it looked fairly obvious. The spacers supplied with the NEC drive were too short and a fair bit of fiddling and packing with washers was necessary to get df1 to line up to the same height as df0. After two hours of frustration but eventual success, there were just two plugs to insert in the back of the drive and we were away. Well, not quite...

When I powered up, df0 would not boot and both drive lights remained on. I immediately telephoned the supplier in something of a panic. "Oh", he said, "you've got the big plug in df1 the wrong way round... it goes in either way". "Not really", I said, "there's a little cut-out and a notch to make sure it only goes in one way". "Yeah", he said, "but you have to force it... it's a bit of a struggle... it's meant to go in the wrong way round". "Of course", I said, "I should have realised... sorry". Much against my better judgement, I forced the plug into the edge connector; the notch fouled the circuit board but I got it in... spurred on by the words of my knowledgeable supplier... "It's meant to go in the wrong way round".

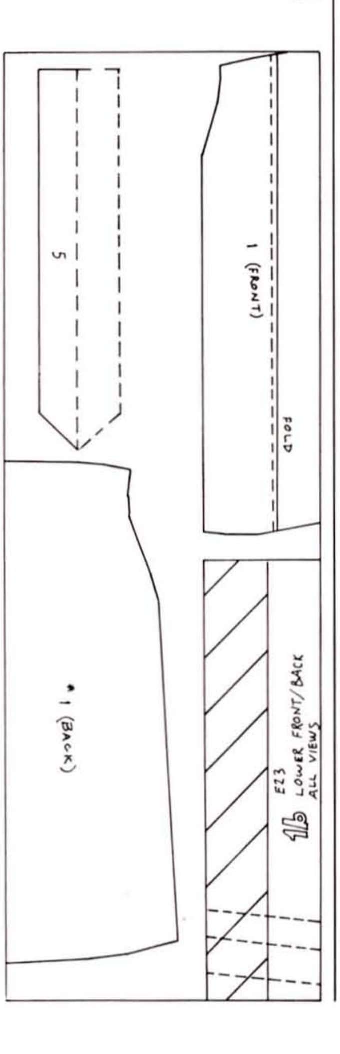
Well, it works. Who am I to argue with my amigo in Southampton. In fact it works beautifully but there are a couple of baffling problems. I bought the machine to use in a video production studio. It runs most programs but chokes on the odd one here and there for no reason that I can understand.

Taking a simple example... Your CoverDisk 2. Everything runs except Virgin's *Gemini Wing* demo which blacks out the Amiga. 17-Bit's PD404 *Supreme Sounds* refuses to run. 17-Bit sent me a new disk – guaranteed OK, but no joy. The two-disk demo of *DPaint III*, – CRASH! *Diskdoctor* tells me Hard Error Track 8 Surface 1.. Track 9 ditto. Block 396 *DPIII* HD Demo info used twice. The two disk 1 meg *VideoStudio* runs OK as do many highly complex all-singing, all-dancing demos. Do I have a problem? Any ideas? Is the Empire striking back beacuse I bought a 'grey' import?

BOB SAUNDERS
READING, BERKSHIRE

In this instance it is not the fact that it's a 'grey' import: it's because you have a machine with a 1 Meg Agnus chip. Some software is incompatible with it because the programmers did not 'follow the rules'. DPaint has now been updated to work with it.





On the subject of grey imports, I don't reccommend them as a rule because of the risks concerning warranties and guarantees. Basically, if you get a grey import you can't expect any help from Commodore if something should happen to go wrong.

PRIZE WINNER

ALL DRESSED UP...

My husband owns an Amiga 500 Computer which is his toy. He often tries to get me (a mere female) interested in same.

Now and again on looking through your magazine I notice that there have been complaints that women do not seem to take up computing as a hobby. When I asked my Husband for some SENSIBLE programmes such as dress designing programmes and machine knitting programmes he goes red and dumb because there does not seem to be anything of a practical nature for us poor women.

When you think that machine knitting is an ever expanding hobby and women's periodicals are always giving free dress patterns it shows the great interest there must be there waiting to be tapped.

Come on you male Amiga Programmers and help us poor women take the Amigas away from you and get your floppies working.

PM BRADLEY
HANWORTH, MIDDLESEX

I am open to suggestions, but somehow I don't think most Amiga owners will go for articles on knitting patterns, romantic novels and whether or not to get one's Fallopians tied: to us mere males, brought up on squodgit high-byte registers, such stuff is as mystical as water.

Seriously though, there is not enough software oriented towards a wider, female audience, but there's only one way to turn the tide and the following letter takes the first step...

...SOMEWHERE TO GO

My 'unusual use' of the Amiga is using it to make patterns for doll's clothes (I have a collection of about 45 Sindies – they even have their own Ferrari 328 GTS!). This is done by saving pattern shapes and all the various markings etc as brushed in *Deluxe Paint II*, so they can later be modified or used again, as thin paper patterns do not last more than a few times. (Yes, I CAN hear all those smirks behind those alien-wasting, mega-blasting, shoot-em-up-fans' fists).

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We had a lot of interest from all sorts of people at the last Commodore show – designers, students, artists, children and a man who does handicrafts with disabled people. There was even one man with his family who said to his wife "See, it WAS worth coming after all!". I gave away lots of copies of patterns to fathers who wanted them for wives and daughters, as a way of getting them interested in their computer.

There was a lady who was soon going to be starting a job working with computers – she didn't know how they worked and said she was very grateful to us for explaining things to her, as everyone else was out to sell their product, and she wanted something her children could take an interest in as well as use for word processing.

Several people thought that the idea could be scaled up using a plotter or something to be used as full-sized patterns. I had people wanting to know if the patterns were available as a PD disk, or if they could buy a copy of the program, which I explained was *Deluxe Paint II*.

SARA MAIDSTONE
NORWICH

And I hear that Newcastle Polytechnic use the Amiga to help students learn dress design, too…

MORE GAMES

Why is it that almost everyone who writes in to your magazine is against having too many games reviews? Personally I would like more. With more games articles and reviews you would appeal to more than just the computer programming side of the market. Why not have a quarterly games supplement giving news of the latest releases and of games not yet available?

At present, whether or not I buy *AF* depends mainly on your cover disk, but by including more games items your magazine would appeal to the whole of the Amiga owning public.

Apart from that your magazine is great, especially the disk. most of the demos are good (exluding *Wicked* and *Purple Saturn Day*, of course) and the recent idea of the Workbench Hacks and the art pictures is fantastic.

One more thing. Why is it that the only letters sent in that receive prizes are long letters including in-depth descriptions of complicated, boring things that are not really of any interest to most people – well not to me anyway?

LEVI PAY
BASILDON, ESSEX



■ **There's no real reason for this picture to be here, but our Ad Manager, Jennie Evans, wanted her picture in the magazine…**

Prizes are given for letters that stimulate thought, entertain or in any other way take my fancy.

IF THE PRICE IS RIGHT

Since the early days of the C64 and Spectrum, there has been a common practice carried out by software houses: Computer Apartheid. This is the practice where a game's price is governed by the computer format it is sold on (I know it's an old argument, but it hasn't been raised in *Amiga Format* before). For example a Commodore 64 game would sell for £9.99 and the Spectrum version would sell for £8.99. The same discrimination is happening on the Amiga/ST software front, whereby an Amiga game will sell for £5 more that an ST game. Why?

I have had many thoughts on the reason for this difference. Could it be because the ST has sold more than the Amiga? (not for long I hope!). I discarded this argument, by looking back at the C64 and Spectrum example. Everybody knows that the C64 is the largest selling home computer of all time, yet its games are more expensive than the Spectrum. This is the exact opposite of the Amiga/ST trend.

Could it be because the Amiga is a more complex machine and needs more programming skill than the ST. No (well, the Amiga is technically, miles ahead of the ST!! (bitchy!)). A well known, and moaned about fact, is that a large majority of Amiga games are ported over from the ST (although, at long last, this habit is dying). So even though code is the same, there is still a large price difference.

So what is the reason for the £5 difference? Greed? It wouldn't surprise me. Wouldn't it be fair if the price for the two formats were the same? I think that the price of software is too high anyway. If the cost of full price games were lowered to £15 the sales of software would increase considerably. I know I would buy more software, than at the current prices.

I would also like to know how mail-order companies can sell software for up to £10 pounds less than the shops. They must still make a profit.

I am interested to hear what the other readers of *Amiga Format* think about software prices. Are we being conned?

MARK HUMPHREY
BASILDON, ESSEX

Your C64 argument, it has to be said, is somewhat flawed. Although it may have been the world's best selling computer, the Spectrum easily outsold it in Britain and software here was priced in respect of that.

The disparity between ST and Amiga prices has been justified on the same grounds. However, Amiga sales have been rocketing and the imbalance ought to be rectified – it will only happen piecemeal, mind. Note the comments on this topic from Commodore's Rahman Haleem in Issue One. Some software houses already have price parity, the rest should follow suit: the question is when?

SOME PEOPLE LIKE SOME THINGS

You say you pay out £800 each month to disk contributors. Rubbish. Let's look at the rest of the disk (excluding the game demo). *Icon Meister* – nice, but PD; *Spreadsheet* – nice, but PD; *Dropcloth*, nice but PD, *Workbench Hacks*, nice but PD.

In fact, the only thing you might possibly have had to pay for is the *Sexy Robot* picture.

You realise, I hope, that the only reason people buy your magazine is to get software that is not PD (they can get this from anybody), but I can see, our money is wasted. I am (as are many others) waiting for Issue 4, when you print this letter and answer some of the the criticisms in an adult fashion (NOT, some people like some things, others…). May I suggest you look at the *Amiga Computing* coverdisk, a demo with source code, well I've sent you a demo with source now, so you have no excuse not to publish it.

JAMES RICHARDSON
HOOK, HAMPSHIRE

There is £800 available every month and we will be delighted to pay it out. It is dependant on the software being good enough to put on the disk. I suspect you would moan even more if we put sub-standard software on the disk.

As for PD software being a waste on the disk, there are a lot of people that don't have the time and energy to hunt through the thousands of available PD disks. We can look for the best programs and distribute them to the wider audience they deserve. Much PD stuff costs the same price or more as our mag plus a disk. ■

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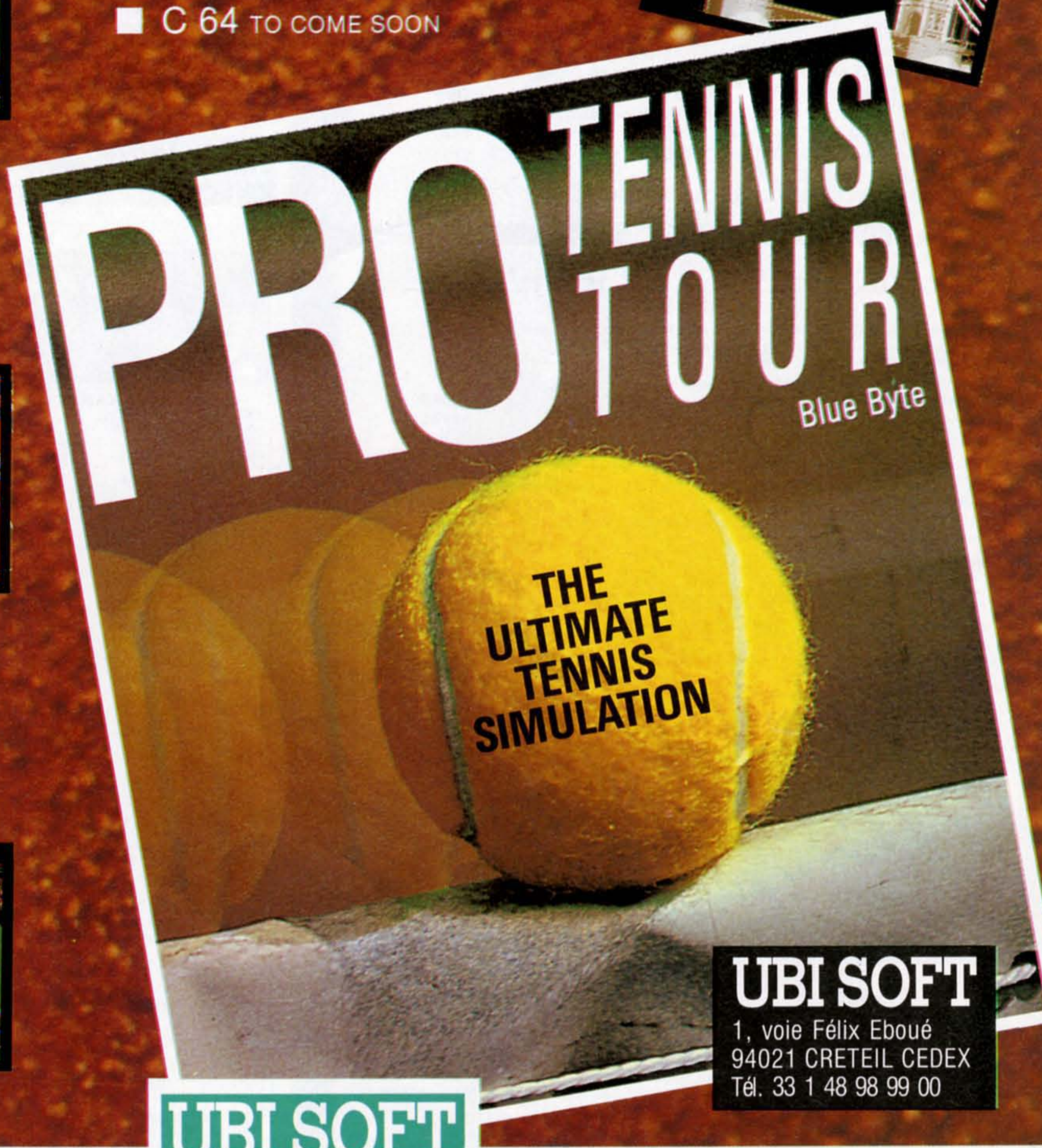


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THE NEED FOR SPEED

Assemblers are rarely things to get excited about, but that was before the arrival of ArgAsm. JASON HOLBORN checks out what promises to be the fastest assembler ever.

There was a time when Commodore would have prefered that programmers steered clear of programming the Amiga in assembler: C programming was about as low-level as they would recommend. While C is still the choice for the majority of American programmers, the language has never really caught on in Europe, and assembler is without doubt the number one programming language for the vast majority of professional European Amiga programmers.

However, while this statement may be true, the most surprising aspect of this is that the majority of games programmers don't even write their wares on an Amiga, prefering instead the PC-based PDS system. Why should this be so when the Amiga offers such a friendly working environment? The answer is simple: speed (or lack of it where Amiga assemblers are concerned!).

The lack of speed of current Amiga assemblers was very much the driving force behind the development of ArgAsm. Argonaut Software, who are best known for their StarGlider games, previously used HiSoft's Devpac 2 system running on the Amiga to develop all their ST and Amiga games software. However, even the relatively fast Devpac seemed painfully slow when handling source code amounting to megabytes rather than kilobytes.

Close To The Edit

ArgAsm consists of a suite of tools that, together, allow the creation of assembler programs. The system consists of two independent versions of the package: the first, Arg, is a CLI-based assembler, while ArgEd is a Devpac-like integrated editor/assembler based around a nice friendly Intuition front end. Unlike Devpac, ArgAsm does not include any form of monitor/debugger and so if you require one, this will have to be purchased separately.

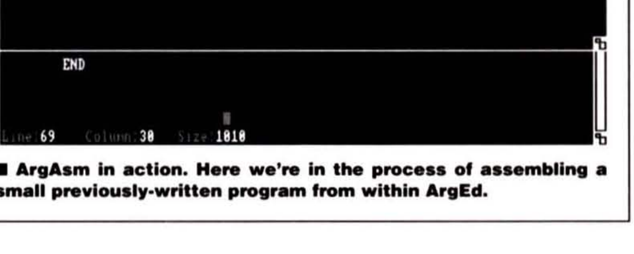
Before you can produce a program, you're going to need to enter your source code using some form of text editor or word processor. Like its main rival, Devpac, ArgAsm includes a powerful text editor as standard. However, unlike the Devpac editor ArgEd is a multiple-window affair that allows you to work on as many different source files at the same time as memory allows. One particularly nice feature is the ability to open multiple windows that can display different parts of the same source file in memory. When you edit any part of the source file, every window learns about the edit immediately and the screen is then updated accordingly.

ArgEd is fully configurable, so you can change attributes such as tab sizes, text buffer size, file backups, auto indenting and numerous others from with the preference menu. Once everything is set up to your satisfaction, your preference setting can then be saved and they are then loaded automatically everytime ArgEd is loaded.

ArgEd also includes several extra options such as a complete number base converter-cum-programmers calculator and a snapshot facility. It's quite surprising to think that such a simple, but so very useful, feature hasn't been incorporated other editors of this type. Never again will you have to hunt through masses of printout trying to locate your trusty calculator!



■ **ArgEd, ArgAsm's integrated assembler/text editor, is a very fast and powerful multi-window affair. Here, we're editing the same source file within different windows.**



■ **ArgAsm in action. Here we're in the process of assembling a small previously-written program from within ArgEd.**

Multiple ArgAsms

Two separate versions of the assembler are included. The first, as mentioned earlier, is built into ArgEd, while the second is designed to be run from the Command Line Interface.

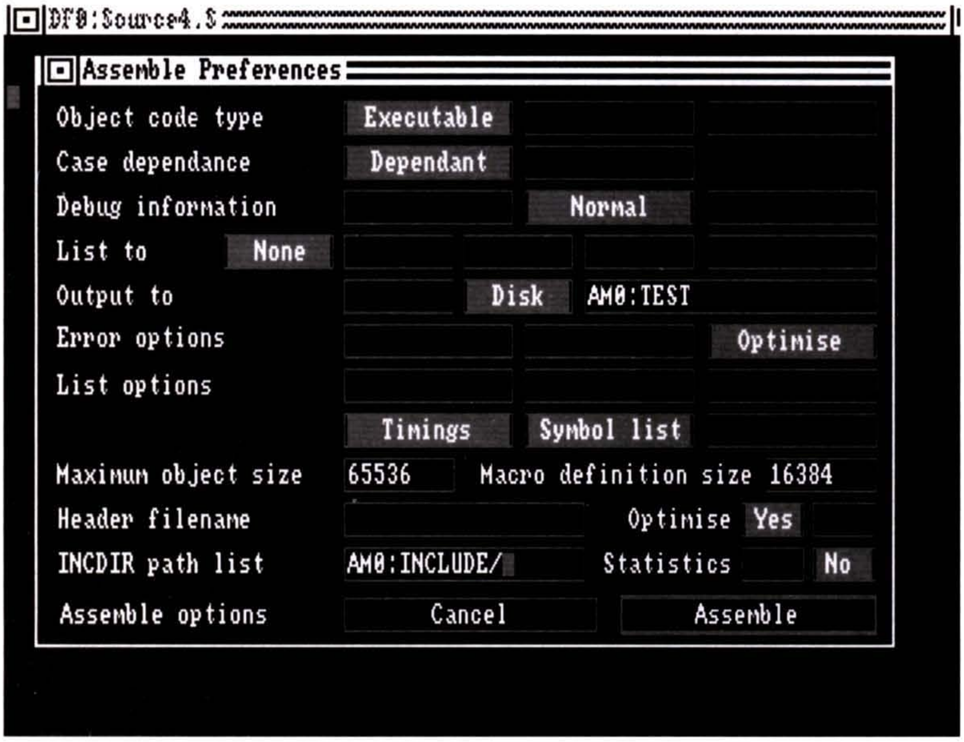
Most assemblers, including Devpac, are two-pass: which means that the assembler parses the source file twice, ignoring any errors due to forward referencing on the first pass, and then filling in all the gaps on the second.

ArgAsm, on the other hand, is a single-pass assembler. This basically means that ArgAsm assembles the source code directly into an object code buffer, keeping track of any forward referencing as it goes along. Once the pass is complete, ArgAsm then resolves any forward referencing by inserting the correct addresses directly into the object code buffer. The advantage of this technique is a significant improvement in performance.

Source Of Confusion

So as to minimalise the hassle of changing from one assembler system to another, ArgAsm is source compatible with several of its main competitors. These include HiSoft's Devpac (1 & 2), Inovatronic's CAPE (a little-known assembler that is popular among American assembler programmers) and Metacomco's ASSEM. Unfortunately, ArgAsm isn't directly compatible with Kuma's K-SEKA, mainly due to SEKA's non-standard code format. However, a conversion utility is a fairly simple thing to write.

The implication of providing compatibility with several different assemblers is basically that ▶



■ ArgAsm's assembler options menu allows you to control every aspect of the assembler.

▸ ArgAsm doesn't lack its fair share of assembler directives. (An assembler directive is simply an instruction that controls the assembler during assembly and can be used to carry out such tasks as pulling binary data (such as graphic data) directly into your program; only assembling defined sections of code when a particular conditional is true; changing memory load type for different sections of code (eg. screen data into chip memory, program into fast memory) and others).

Life In The Fast Lane

When you select the assemble option from within ArgEd, the program brings up an assembly options menu that allows you to tell the assembler how to operate. As well as the usual things such as output type, listing and program output filenames etc, the assembler also provides optional optimization, display of each instruction's cycle time and other additional information to aid program development.

One sad ommision is the ability to assemble your code to memory and then run your program from within the editor (a la Devpac). With ArgAsm, the only way of running your code is to either exit back to the CLI or open another separate command line window.

From your very first use, ArgAsm's astounding operational speed will become more than evident. Depending on the complexity of your code, speed increases of over seven times that of the Devpac, ArgAsm's fastest competitor, are easily achieved (stick an '030 board and fast hard drive into your Amiga and things will really start to cook!) Once you start using ArgAsm, you'll never want to go back to any other Amiga assembler.

Conclusion

If you're not particularly keen on the idea of having to produce all your source code using ArgEd, ArgAsm will also work fine with source code produced using other editors (including Devpac's!) You could either read source code produced using another editor directly into ArgEd and then assemble it from within there. Alternatively, you could scrap ArgEd all together and use the CLI-based Arg assembler in conjunction with your favourite text editor. Either way, you'll find ArgAsm to be a very flexible friend indeed.

Speed is undoubtedly ArgAsm's main selling point, but the inclusion of compatibility with such big names as Devpac and Cape is sure to earn ArgAsm many friends. Unlike the seemingly accepted norm, there's no reason to scrap all your old source code just because you're using a different development system: just run it through ArgAsm and, if it is compatible with one of the three named assemblers, chances are it'll assemble without modification.

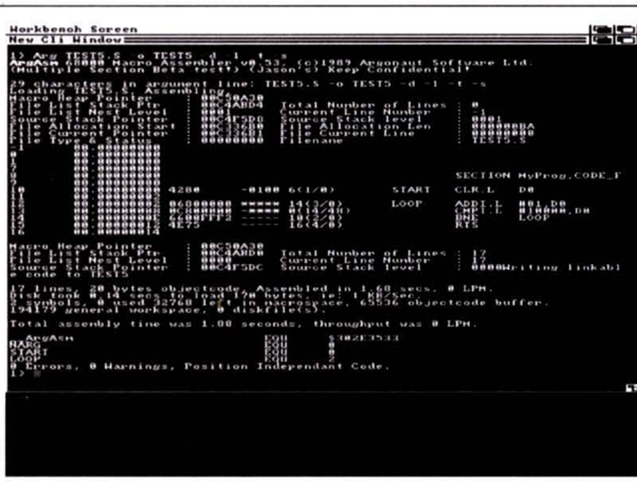
If you're an Amiga assembler programmer, you really cannot afford to ignore ArgAsm. The combination of compatibility with existing assemblers and an operational speed that even puts PDS systems to shame, deserves to make ArgAsm the Amiga industry standard. ■

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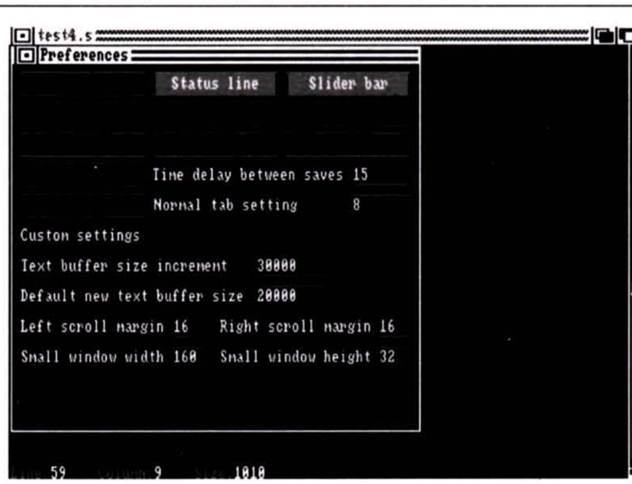
ARGASM FOR PROS

Argonaut intend to constantly upgrade ArgAsm by providing enhancement upgrades that range from straight bug fixes right up to the addition of major new features to further enhance an already impressive development system. According to Argonaut, upgrades will be available to registered users for about £10-15, according to the amount of work that was involved in the upgrade.

Also on the books is a more powerful version of ArgAsm, provisionally called ArgAsm Professional, that will provide direct support for the 68030 (possibly even the 68040), 68881/68882 and many other sophistication enhancements.



■ For the purists (for 'purists', read 'people who like to make life awkward') among you, ArgAsm can also be used from the CLI.



■ The ArgAsm preference menu allows you to tailor your working environment to suite your own personal needs.

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ST: Purple Saturn Day demo, Database construction set.
Magazine: Autoroute (the computer journey planner), Sculpt 4D, a modelling package, Protext (THE word processor for your Amiga then!), Cameron's Handy Scanner reviewed.

Issue 9 ■ Sold Out, Sorry!!

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Cover Disk: **Amiga:** Cybernoid II (playable demo), Learn Devpac 1.
ST: Zak McKracken (playable demo), Learn Devpac 1.
Magazine: Upgrade your machine with extra magabytes, Daatascan hand-held scanner from Kempston Samplers.

Issue 11 ■ Order Code AM211
Cover Disk: **Amiga**: Blood Money (playable demo), File requester, add requesters to programs.
ST: Archipelagos, playable demo, Fastmouse, speed up mouse operation.
Magazine: Make yourself a sound sampler, Deluxe Paint III, Animation tutorial, Why not invest in a better screen? Here's the choice...

Issue 12 ■ Order Code AM212
Cover Disk: **Amiga:** Colossus Chess, playable demo, TirusX V3.1 protect your disks against viral infection, Boot intro, add scrolling messages to your disks.
ST: Flair Paint, usable demo of this brilliant art package.
Magazine: Video digitising, Attach a midi system to your machine and make music, The best available joysticks.

Issue 13 ■ Order Code AM2113
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ST: Spherical, an excellent playable demo of this strategy game.
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Amiga Format Issue 2 ■ Order Code AM2112
Cover Disk: Gemini Wing, the wildly addictive demo from Virgin Games. Spread, an immensely practical spreadsheet. Dropcloth, designer tablecloths to cover you Workbench.
Magazine:Have a look at the A590 Hard Disk. DTP Special. We take a look at the Video Factory.

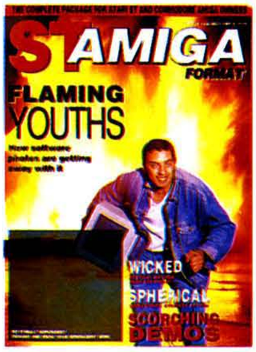
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Cover Disk: Xenon II, from Mirrorsoft Probably the best shoot-em-up in the world. Plus, DPaint clip art, us in conjunction with our DPaint tutorial.
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GURU's MEDITATION

OH DEARY, DEARY ME

Coupla cock-ups on last month's Coverdisk, for which we smite our fore-heads in abject exasperation. First up was the fact that because the *DPaint* clip-art was crunched, compressed, compacted and generally fiddled about with by *DPaint III*, it will only work with the latter versions (*II* and *III*) and not with the original. Sorry!

The second thing was a bit less noticeable: we gave you an extra piccy by accident. It was of the *Xenon 2* logo, grabbed to use for the icon. Guess who got his botty smacked for those two.

CAPTAIN WHINGE

......they're all wimps the lot of them, everyone knows it's really cool to program the Amiga hardware directly, infact, it's so cool that I'm getting a T-shirt printed just to let everyone know that I'm man enough to program the Amiga hardware directly, anyway, using the operating system routines is just quite simply wimping out, I really enjoy having to write reams and reams of assembler code just to make the machine realise that I've pressed a key on the keyboard, and one thing's for sure, I've got the best keyboard scanning routine ever devised, it'll play the yellow rose of texas every time you press the 'A' key whilst you've got your finger in your ear, and all this is only 400k......

NEXT MONTH

The December issue will be on sale on Thursday 9th November. On the Coverdisk will be a playable demo of *Ghostbusters II*, set to be a smash hit film and game.

Barring Acts of God and busted deadlines (which of course we never, ever, ever, ever do) we will have a look at the best in 3D graphics, a round-up of sound samplers, the lowdown on the comms scene and a bumper games section as the Christmas boom approaches. Hang onto your fish.

PC SHOW ITINERARY

As we close the issue the PC Show is about to take place. Here's the itinerary for one of the *AF* team - no names, no pack-drill.

WEDNESDAY

10.00 arrive: check show map for the bars.
10.02 snorter at the Long bar.
12.00 walk around show trying to find someone to buy me a drink.
13.00 sit on stand pretending to be selling something.
15.00 go up to people handing out leaflets and turn away just as they go to give you one.
17.30 give up for the day.

THURSDAY

10.00 Ocean
11.00 US Gold
11.30 Ocean again
12.00 Mirrorsoft
12.30 US Gold again
13.00 Activision
13.30 Mirrorsoft again
14.00 Domark
14.30 Activision again
15.00 Psygnosis
15.30 Domark again
16.00 Virgin
16.30 Psygnosis again
17.00 Mindscape
17.30 Virgin again
18.00 Entertainment International
18.30 go home in ambulance

FRIDAY

Recover from Thursday by visiting all the bars twice.

SATURDAY

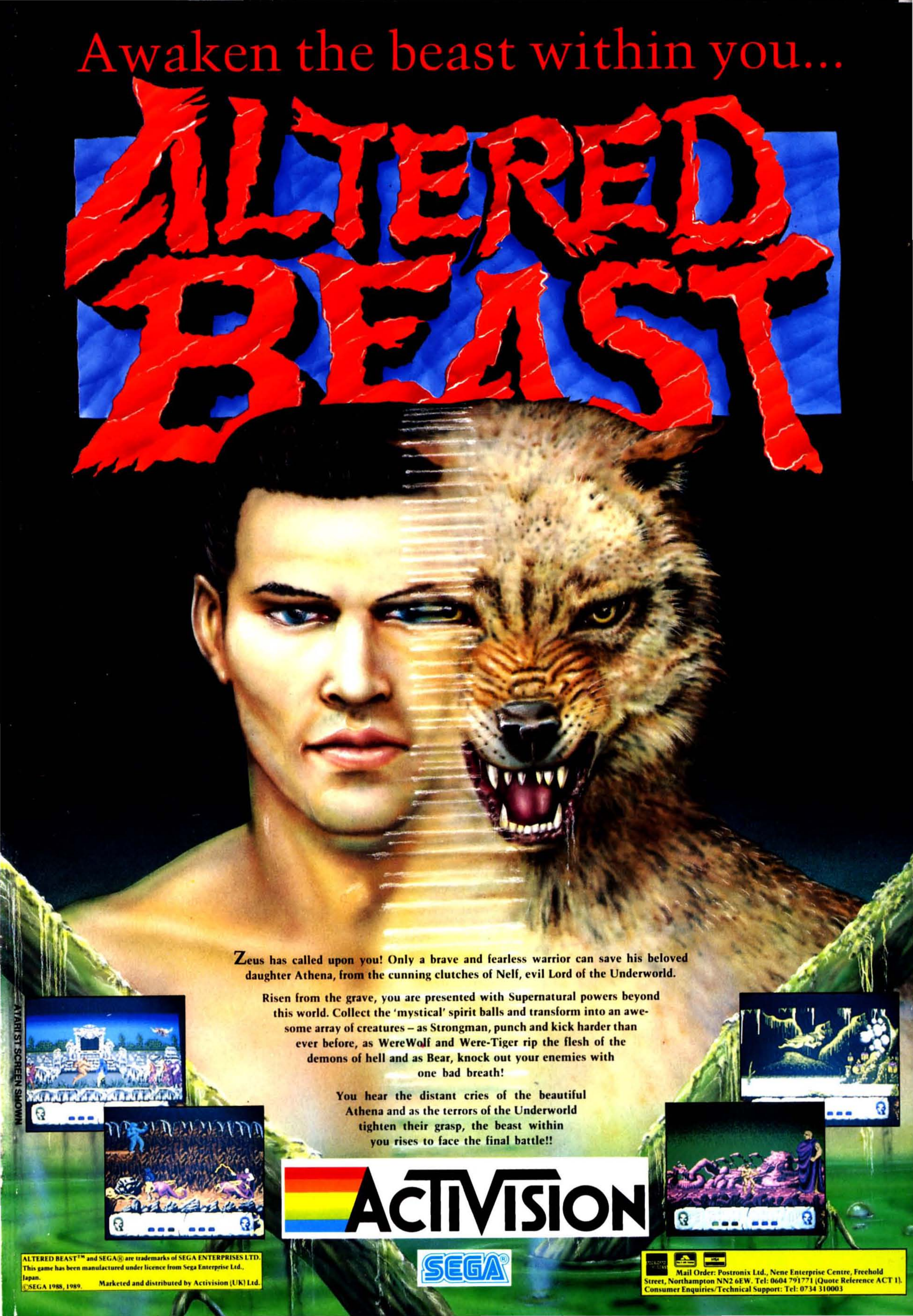
10.00-18.30 rush around with eight carrier bags collecting every poster, badge, leaflet, bit of blank paper, polystyrene packing and carpet fluff to be found.

SUNDAY

10.00-16.00 go to every stand in the show and tell the head honcho you thought their stand was much better last year.
16.00-17.00 take pictures of stands being dismantled by gangs of 12-year-olds and sell them to national newspapers as evidence of inner-city rioting.

COMPETITION WINNERS ■ Here are the winners of the *GEMINI WING* compo in Issue 2: Winner – S Mitchell, Cippenham. 10 Runners-up - Duncan Houston, Stockton-on-Tees; N Delaney, London SW20; David Rom, London NW11; Stephen Peters, West Derby; B Myers, Douglas; Christopher Young, Seaton Ross; JD Fagg, Tonbridge; N Lee, Edenbridge; Darren Abbott, Beauchief; Tim Laybourn, Hatfield. 25 other prizes - Kathleen Chisnall, Hornchurch; Ben Powell, Orlingbury; Peter Badger, Bessacarr; Andrew A Adams, Headingley; Eddie Curtis, Coggeshall; GS Roberts, Pudsey; Frazer Drew, Church Gresley; AH Foster, Bassett; Mark Hilton, Heston; MJ Humphrey, Langdon Hills; S Hobdell, Mildenhall; Joshua Howlett, Isleham; Steven Mellon, Knowle; Paul Minshull, Emmer Green; Brian Wise, Salisbury; Derek P Robbins; JA Wheeler, Cheltenham; AC Anderson, Newbiggin by Sea; Tom Chapman, Earls Barton; Ross Hendricks, Peterculter; Sara Maidstone, Norwich; John Gilligan, Glasgow; Huw Gill, Moulton; Peter Jones, Worcester; Stephen Lodge, Horbury.

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